A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE – NON-DOMINANT HAND TE

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I hereby declare that the thesis entitled "**A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE – NON-DOMINANT HAND TE**" submitted towards partial fulfillment of the requirements for the award of **MD in Anaesthesiology** degree to BFUHS is a compilation of original work carried out by me under the supervision of **Dr. Anju Grewal**, Former Professor & Head, Department of Anaesthesiology and **Dr. Gurpreeti Kaur**, Associate Professor, Department of Anaesthesiology. No part of this thesis has formed the basis for the award of any degree previously.

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Dedicated

to

my Family,

friends

&

Teachers

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DR NEETU SAROYE

ABBREVIATIONS

AMBU	Artificial manual breathing unit
ASA	American Society of Anesthesiologists
BMI	Body mass index
BMV	Bag mask ventilation
Cms	Centimeters
DBP	Diastolic blood pressure
DMV	Difficult mask ventilation
ECG	Electrocardiography
$EtCO_2$	End tidal carbon dioxide
F/M	Female /male
FB	Failed breath
GA	General anaesthesia
GETA	General endotracheal anaesthesia
H/O	History of
H_2O	Water
HR	Heart rate
I:E	Inspiratory :expiratory
ICU	Intensive care unit
IV	Intravenous
JR-1	Junior resident first year
JR-3	Junior resident third year
Kg	Kilograms
Kg/m^2	Kilogram per meter square
L/Min	Litres per minute
Mcg/kg	Micrograms per kilogram
Mg/kg	Milligram per kilogram
Min	Minutes
Ml	Milliliters
Ml/kg	Milliliters per kilogram
mmHg	Millimeter of mercury
MMPS	Modified Mallampatti score
NIBP	Non invasive blood pressure

NM	Neuromuscular
NSR	Normal sinus rhythm
OR	Operation room
PCV	Pressure control ventilation mode
PIP	Peak inspiratory pressure
RR/Min	Respiratory rate per minute
SBP	Systolic blood pressure
SD	Standard deviation
SpO_2	Oxygen saturation
TE	Thenar eminence
VS	Versus
VT_e	Exhaled tidal volume
Yr	Year

KEYS TO MASTER CHART

ASA	American Society of Anesthesiologists
DBP	Diastolic blood pressure
Deg	Degree
ECG	Electrocardiogram
EtCO2	End tidal carbon dioxide
FB	Failed breath
HR	Heart rate
MRD no	Medical records department number
S. No	Serial number
SBP	Systolic blood pressure
SpO2	Oxygen saturation
TMJ	Temporomandibular joint
TV	Tidal volume
ULBT	Upper lip bite test

ABSTRACT

BACKGROUND: Airway providers are often faced with emergent scenarios to manage oxygenation with Bag mask ventilation (BMV) in unconscious apnoeic patients. Though the conventional CE double handed techniques have been shown to provide effective ventilation, inexperienced healthcare providers however face difficulty, necessitating need for evaluating a hybrid technique of BMV. We hypothesized that the use of a BMV technique which combines the EC and TE grip might prove superior to use of any one technique solely. Hence, we proposed to compare the efficacy of traditional CE technique versus a hybrid technique combining use of dominant hand CE and non-dominant hand TE technique of BMV in providing effective ventilation when performed by airway providers with limited experience.

METHODS: A total 132, ASA I-II adult patients without predictors of Difficult Mask Ventilation (DMV) were randomized into two groups A and B. After induction of anaesthesia and neuromuscular blockade group A received BMV using double handed CE and group B received BMV with dominant hand CE-non-dominant hand TE technique by airway providers with limited skills in airway management. Anaesthesia workstation Ventilator was preset to PCV mode with PIP of 15 cms of H_2O, 12 breaths per minute, I:E ratio 1:2 with no PEEP. The primary outcome observed was 2 minute (24 breaths) mean exhaled tidal volume and secondary outcomes were number of failed breaths and comfortability level of the airway providers using 5 –point Likert scale.

RESULTS: The mean exhaled tidal volume observed in group A [377.51ml (SD 82.79)] was significantly lower than that observed in group B [476.71 ml (SD121.85)] (p value 0.001) The mean $EtCO_2$ in group A [28.83 (SD 1.83) mmHg] was significantly less than group B [30.42(SD2.59) mmHg],[p value 0.001].There was no significant difference in the number of failed breaths and comfortability level of both the techniques.

CONCLUSION: The hybrid technique dominant hand CE and non-dominant hand TE technique provides effective ventilation as compared to double handed CE technique.

KEY WORDS: Bag mask ventilation, double handed CE, dominant hand CE-non-dominant hand TE, exhaled tidal volume.

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INTRODUCTION

Bag Mask ventilation (BMV) is a critical airway management skill which needs to be proficiently acquired by all airway managers and healthcare providers. Appropriate and effective BMV is needed not only for apnoeic patients during induction of general endotracheal anaesthesia (GETA), but also for unconscious apnoeic patients in the pre-hospital, hospital triage and ICU settings.[1,2] Failure to effectively deliver BMV can result in irreversible hypoxic brain injury and cardiovascular collapse.[3] Thus it is imperative that all healthcare providers are trained in the most efficient techniques of BMV.

Effective BMV necessitates proper patient positioning, a patent upper airway and an adequate mask seal.[1] A good grip of the mask which does not allow egress of air from the interface between patient's face and mask while maintaining an open upper airway is needed for an effective mask seal.[4-7] Various predictors of difficult BMV have been elucidated from many studies viz., edentulous patients, presence of a beard, old age, BMI >26 kg/m^2, history of snoring, improper sized mask, etc.[8] A report by American society of Anesthesiologist task force on the management of difficult airway stated that problems in BMV can occur due to issues like insufficient coverage of mask on face due to ill-fitting mask size, air leak from the face - mask interface and a high resistance to air stream mainly due to inability to keep the upper airway fully unobstructed at all times.[9] Many of these issues could be resolved by switching to the two-hand techniques of BMV with the use of a properly fitting mask. Though a skilled provider may be able to adapt and overcome difficulties in BMV efficiently a novice provider can face failure of BMV due to inadequate mastery of the essential components of the techniques of BMV, especially opening of upper airway, whilst maintaining adequate air seal.[10] Moreover during times of emergent need for BMV most often the provider is challenged to effectively provide BMV for prolonged periods of time. In

order to achieve all these aspects of an effective BMV, one needs to be trained in the easiest yet efficient technique of BMV.

Traditionally the beginners were taught the one handed EC clamp technique of mask holding in which one hand was used to hold the mask on the face in such a way that thumb and index finger makes C shape over mask and secures the mask tightly around nose and face and the rest of the three fingers make the shape of E, using the ring and middle finger to rest on mandible while little finger provides jaw thrust.[11] However the single handed EC clamp technique was fraught with air leaks with resultant inadequate chest rise on BMV. Various manikin studies have corroborated the inability of novice providers to provide effective BMV while using single handed EC clamp technique in comparison to their experienced counterparts.[10] Indeed the two handed EC clamp technique has been recommended by many health care agencies like American heart association, and the New England journal of medicine videos in clinical medicine.[12,13]

Despite the popularity of the EC clamp technique of BMV, significant failure rates have been often reported. Some studies have proposed that the upward force generated by the fifth finger at the angle of jaw maybe insufficient to advance the mandible anteriorly to relieve upper airway obstruction in unconscious apnoeic patients.[14] Hence many alternative techniques have been investigated which may provide efficient BMV for prolonged periods by airway providers of varying experiences and training backgrounds across all clinical settings.

The two handed Thenar eminence (TE) technique is one such alternate technique which involves downward pressure on the mask with the thenar eminence of airway provider to create an air tight seal on the face of the patient, while the four fingers of each hand pull the jaw upwards towards the mask.[14] The TE technique enhances airway patency due to advancement of lower jaw by all fingers with concomitant lack of compression on the submandibular tissue.[14,15]

These two-handed techniques have been proposed to provide better seal with adequate airway patency thus generating greater tidal volumes. [14,15] However they require an additional provider or a mechanical ventilator which provides positive pressure breaths. Mechanical ventilator is now incorporated in all anaesthesia workstations which confers the advantage of providing an additional objective diagnostic information for assessing effectiveness of BMV techniques used. In addition pre-setting the peak airway pressure to less than 15 cms of H_2O with the use of pressure control ventilation has been reported to provide effective mask ventilation with minimal gastric insufflation. [7,16]

Various studies have compared two handed CE techniques with two handed TE technique of BMV in patients and manikins.[1,14,15] In a manikin based study Soleimanpour et al evaluated the quality of four different BMV techniques –double handed EC, TE (thenar eminence), TE (thenar eminence dominant hand)-EC (non-dominant hand), EC (dominant hand) and TE(non-dominant hand). The researchers observed statistically significant effectiveness of TE (non-dominant hand)-EC(dominant hand) technique of BMV in the group of novice providers as compared to other techniques, whereas the experienced group of providers could perform all four techniques with equal proficiency.[17]

In a randomised crossover study, Gerstein et al, compared the efficacy of double handed TE and EC face mask grip in terms of expired tidal volumes generated by both techniques. Novice providers were recruited for the study. It was observed that TE grip resulted in greater tidal volumes and was superior to EC grip technique.[14] On the other hand Althunayyan et al in a randomised crossover study reported superiority of two handed CE over VE technique in terms of effective breaths and comfortability despite comparably similar median exhaled tidal volume in both groups. However, the study was conducted on a simulation model with respiratory therapists who are usually well versed with the techniques of BMV.[1]

Airway provider's comfort is always a concern in all real-life clinical situations in which prolonged BMV is needed. Perhaps combining the familiar traditional CE technique with the TE technique might result in higher degree of effectiveness of BMV. In view of conflicting literature evidence, we propose to comparatively evaluate the efficacy of two handed BMV techniques, the traditional two handed CE versus the hybrid technique of dominant hand CE with non-dominant hand TE, when performed by airway providers with limited airway management experience on human subjects who do not have predictors of difficult BMV.

AIMS AND OBJECTIVES

PRIMARY OBJECTIVE: To compare the 2 minute (24 breaths) mean exhaled tidal volume between the two-handed CE versus the dominant hand CE with non-dominant hand TE mask holding techniques.

SECONDARY OBJECTIVES:

1. To compare the number of failed breaths as reflected by no exhaled tidal volume among both techniques
2. To compare the Comfortability level of airway providers with the use of both techniques using 5-point Likert scale.

REVIEW OF LITERATURE

The history of bag mask ventilation dates back to 1950's when during the epidemic of polio, shortage of oxygen provoked Henning Ruben to conceive the idea of a self-inflating bag, which would work in the absence of an oxygen supply.[18,19] Dr Holger Hesse suggested some modifications to the bag design and in 1957 the bag was marketed as the "AMBU Bag". This marked the beginning of BMV.[20] Since then the bag and mask ventilation has been commonly used in emergency situations and in pre-hospital settings.

Bag mask ventilation (BMV) has now emerged as one of the basic skills of airway management. Although BMV apparently seems easy, but it can be a great challenge especially when needed for extended period of time by providers with variable experience.[10] Mask ventilation is required by all patients undergoing general anaesthesia after the patient becomes apnoeic. Failure to achieve effective mask ventilation may be rescued by successful intubation, but in majority of the cases difficult intubation often coexists with difficult mask ventilation.[4] Indeed difficult airway guidelines propose BMV as a rescue strategy when faced with an inability to intubate. Thus failure to effectively provide BMV predisposes the patient to hypoxia and if uncorrected may lead to hypoxic brain damage or death.[3] Moreover airway management is an important part of cardiopulmonary resuscitation and adequate ventilation is one component of effective airway management.

Reported epidemiological data suggest that difficult BMV occurs in 1.4% of patients undergoing general anaesthesia and in 4-11% of patients presenting to emergency settings.[6,21] Sometimes difficult BMV results due to inadequate mask seal, increased airway resistance and decreased lung or chest wall compliance.[7] There is discriminate flow of gas to lower resistance path, thus an inadequate seal at mask –patient interface will provide low resistance escape of positive pressure breaths.[7] Langeron et al in 2000 identified various factors that can cause difficulty in BMV, which

include age >55 years, BMI>26 kg/m^2, bearded, edentulous patient and history of snoring.[8] Khetarpal et al in their multivariate regression analysis identified the independent predictors of DMV which included BMI of 30 kg/m^2 or greater, beard, Mallampati classification III or IV, age of 46 yr or older, thyromental distance of less than 6 cm, severely limited jaw protrusion, and snoring.[4]

Keeping in mind the difficulties in BMV, various optimization measures have been described in literature. The problem of inadequate mask seal can be overcome by using small appropriate fitting mask to reduce dead space and eye compression. Also the top of the mask should be placed slightly inferior to bridge of nose to avoid leak into the eyes.[1] Taxak et al in 2008 stated that using a rolled up gauge that covers the vestibule of the oral cavity in a packed way can improve BMV in edentulous patients.[22] Placing the inferior part of mask inside the lower lip at alveolar ridge has also been proposed to improve mask seal in edentulous patients.[23]

A report by American society of Anesthesiologist task force on management of the difficult airway in 2003, stated that problems in BMV can occur due to issues like insufficient coverage of mask on face, air leak and high resistance to air stream.[9] Many of these issues could be resolved by adapting to two-hand techniques of BMV. Soleimanpour et al conducted a study in which they elaborated on 3 main problems with inadequate ventilation which include inadequate air stream, lack of oxygen and gastric distension and proposed that these problems can be minimized by adopting two handed BMV techniques.[24] Use of sniffing position and jaw thrust along with two handed techniques further assist in successful BMV. Thus, several investigators have emphasized on studying and comparing different techniques of mask holding (one-handed with one-handed, one handed with two-handed and two-handed with two-handed) in clinical as well as non-clinical mannequin-based settings.

Aaron et al in 2009 conducted a prospective randomized cross over study in adult obese patients with BMI >30 kg/m^2 comparing one-handed EC

clamp technique with two-handed jaw thrust technique. In one handed technique, jaw thrust was performed by placing operator thumbs on oropharyngeal airway and then simultaneously pulling the mandible forward with index finger and second finger of both hands. An appropriately sized mask was then placed over bridge of nose and mouth followed by chin lift and head tilt. In two- handed technique, the face mask was first placed over the bridge of nose and mouth then held in place by performing jaw thrust maneuver with the index finger of each hand and maintaining mask contact with patients face using both thumbs. Each technique was performed for 5 consecutive breaths and resulting tidal volumes were recorded. The primary outcome of the study was total minute ventilation in litres per minute and the exhaled tidal volume. They observed that inadequate or dead space ventilation occurred more frequently during one handed technique as compared to two handed technique.[16]

Hart D et al performed a prospective randomized study in which three techniques of face mask ventilation were compared based on median exhaled tidal volume and proximal peak flow pressure. This was a mannequin study in which a standard airway-training mannequin was modified to produce variable airway resistance. To achieve this, the distal trachea of the mannequin was attached to a 3/4th -inch internal diameter vinyl tube connected to a water column. This model provided a quantifiable amount of distal tracheal airway pressure via hydrostatic forces created by altering the height of the water column. A standardized height of 55 cm H2O was used, as it created a simulation in which BMV was difficult, but not impossible. A standard ventilator was used to deliver a fixed volume of 500 ml at a rate of 10 breaths/min to a standard transparent disposable plastic face mask with a high-volume, low pressure cuff. Each subject performed face mask ventilation for 3 min per technique (30 breaths) in a randomized order. The investigators observed that both two-handed ventilation techniques were more effective than the

one-handed technique by both volume and pressure measurements. One-handed C-E technique yielded a median volume of 428.4 ml, vs. 550.8 ml with the two-handed C-E technique, and 538 ml with the two-handed V-E technique.[25]

BMV is a critical airway skill that is required both in emergency and nonemergency conditions by health care providers with limited airway experience as well. The traditional EC technique has been compared with other BMV techniques so as to elucidate an optimized BMV technique for use in novice airway providers.

Gerstein et al in 2012 conducted a randomized crossover comparison study on 60 novice clinicians (medics and paramedics) who had no or limited experience of airway management. Subjects were assigned to perform 2 two-handed mask grip techniques: TE (in which downward pressure is applied with the thenar eminence while the 4 fingers of each hand pull the jaw upwards towards the mask) or EC clamp technique (in which thumb and the index finger form a C around the neck of the mask and other 3 fingers form E on the inferior portion of the mandible). The subjects performed each technique on the same patient undergoing general anaesthesia in crossover manner for 1 minute (12 breaths). The primary outcome was mean expired tidal volume compared between both groups and secondary outcome was mean peak inspiratory pressure (PIP). TE grip resulted in greater expired tidal volume (379 ml versus 269 ml). Using EC grip first resulted in an average tidal volume improvement of 200 ml after crossover to the TE grip. There was no significant difference in PIP using the two grips. The results of the study however cannot be applied in emergency situations and there may be substantial difference depending on hand size. In addition, as the study was done for 2 minutes hence it is difficult to comment as to how each grip will perform over a longer period of time.[14]

Goneppanavar Umesh et al in 2013 conducted a prospective randomized and crossover study on manikin wherein they compared

single handed EO technique to single handed EC technique which was performed by a total of 100 experienced and novice volunteers. The EO technique involved encircling the neck of the mask with web between the thumb and the index finger while the other digits performed the chin lift. The 2 independent observers recorded the chest expansion as 1(nil), 2 (minimal), 3(moderate) and 4(good).The chest expansion was considered ideal if both observers gave 4 scores, average if both or any one of the observer gave 3 and poor if observer gave 1 or 2. They concluded that with conventional EC clamp the chest expansion was ideal, average and poor in 31, 18 and 1 instances respectively among the experienced and 17, 22 and 11 respectively with novice volunteers. With EO technique the chest expansion was ideal, average and poor in 38, 9 and 3 instances with experienced and 32, 14 and 4 respectively in novices. In cross over analysis for experienced providers, the both techniques had similar chest expansion on maximal occasions but in case of novices, EO technique was better than EC technique. The limitation of the study is that it is manikin based study. Secondly other important parameters such as tidal volume and peak airway pressure were not evaluated.[10]

The superiority of two handed technique has also been described in study by David Otten et al in 2014. They conducted a prospective crossover study on 52 subjects (physicians, residents, medical students who have diversity of experience) in which they performed 1-handed, 2-handed (in which thumb and index finger forms a C around the mask apex and remaining fingers lifts the jaw) and modified 2 –handed (in which third finger is shifted down to angle of jaw to pull upwards and uses thenar eminence and thumb to apply downwards force on mask) BMV technique on standardized ventilation model. Subjects performed each technique for 5 minutes. The primary outcome of the study was expired tidal volume measured by specialized inline monitor. They concluded that 1 handed technique resulted in lower median expired tidal volume than 2 –handed technique, but there was no difference between the tidal volume

generated by both 2 handed techniques. The limitation of the study was that it was not done on patients, hence the patient factors affecting BMV were not studied. Difference in hand width, strength and experience may have influenced the results.[26]

Maryam Soleimanpour et al in 2016 compared the efficacy of the four techniques (EC, Thenar eminence, Thenar eminence (dominant hand)-EC (non-dominant hand) and Thenar eminence (non-dominant hand)- EC (dominant hand) of mask ventilation in the two groups of experienced and novice staff on manikins. They recruited 120 volunteers and divided them into 2 groups of 60 experienced and 60 novices. Every participant in each group performed 4 BMV techniques under the guidance of an experienced assessor. The quality of manikin chest expansion was recorded using four scale scoring system. In this scoring system score 1 indicated no appreciable chest expansion, score 2- minimal chest expansion, score 3-moderate chest expansion, score 4-good chest expansion. Ventilation efficacy was considered as ideal, average and weak if the achieved scores were (4-4),(3-3 or 3-4 or 4-3) and (1 or 2 at any of the attempts) respectively. They concluded that novice group performed Thenar–eminence (non-dominant hand)–EC(dominant hand) technique better than the other techniques. But in experienced group there was no significant difference between all techniques. Limitations of this study were that is was performed on manikins and hence clinical studies using similar techniques need to be conducted in patients to evaluate applicability to clinical settings.[17]

Fei et al in 2017 compared the effectiveness of two handed CE technique and VE clamp technique of mask ventilation on 81 unconscious obese (BMI>30kg m^2) adults undergoing general anaesthesia in a randomized crossover study. Patients were kept on mechanical ventilation using pressure control mode. The ventilation was started with either CE technique followed by VE technique (group A) or with the reverse sequence (group B). The primary outcome studied was expired tidal

volume. The investigators concluded that the exhaled tidal volume was significantly lower for CE technique than the VE technique (371(SD 345) versus 720 (244) ml, P<0.001) and observed that the subjects who failed ventilation with CE technique could be ventilated effectively with VE technique.[15]

Soleimanpour M et al conducted a manikin based study in 2018, in which they compared 3 techniques of mask ventilation: Thenar eminence, EO and EC technique among undergraduate students and senior group. Each participant performed six ventilations with bag and mask (each technique 2 times). The ventilation quality by bag and mask in two groups was recorded based on rise of lungs and opinion of reviewer who gave a score from 1 as weak to 4 as excellent using three techniques. They concluded that undergraduate group performed EO technique appropriately and better than other 2 techniques.[27]

Goneppanavar Umesh et al in 2018 conducted a double blinded prospective crossover study on 60 patients who were randomly allocated to EO and EC group. After adequate anaesthesia and neuromuscular blockade, a novice (experience of less than 5 attempts of BMV) held the mask with preferred hand using the allocated single handed technique, while the ventilator provided 5 breaths at set pressure control of 15 cm H_2O with one second each for inspiration and expiration. The primary outcome was exhaled tidal volume for each breath for 5 consecutive breaths. The secondary outcomes were minute ventilation, audible mask leak and epigastric leak. They concluded that the average tidal volume difference between the groups was about 46.5$\pm$106.6 ml over five breaths with EO technique providing superior values as compared to EC technique(286.2$\pm$107.41 versus 239.56$\pm$103.95 ml).The minute ventilation was also higher with the EO technique (2.86$\pm$1.05 L/min) as compared to EC technique (2.35$\pm$1.12 L/min). This study demonstrated that EO technique provides better mask seal in hands of novices as reflected by better tidal volumes and minute ventilation by this technique.[11]

Althunayyan et al in 2020 conducted a randomised crossover study and compared the two-handed CE and two-handed VE techniques performed by a total 74 respiratory therapists on a simulation model. Each participant performed 2-minute ventilation session (24 breaths) for each technique. For each technique mean tidal volume and the successful breaths ($\geq$300 ml) was recorded. The comfortability was assessed through a 4-item likert scale questionnaire that consisted of 5 points for each question assessing the level of agreement on each question where 1 indicated very easy to control the mask during ventilation and 5 indicated that it was too difficult. They concluded that there was no statistically significant difference in the mean tidal volume between both techniques. The CE technique resulted in more percentage of effective breaths as compared to VE technique and most of the participants reported two-handed CE technique to be more comfortable.[1]

Taken together, these studies suggest that both two-handed EC technique and TE technique are effective techniques for BMV when used by providers with limited airway management experience. We hypothesized that perhaps use of a BMV technique which combines the EC and TE grip might prove superior to use of any one technique solely. Therefore, we proposed to comparatively evaluate the efficacy of traditional two-handed CE technique with a hybrid BMV technique of Dominant hand CE –Non-dominant hand TE in subjects who did not have predictors of difficult mask ventilation.

MATERIALS AND METHODS

SOURCE OF DATA

A randomised prospective study was conducted in the department of Anaesthesiology, Dayanand Medical College and Hospital, Ludhiana after approval by Institutional Ethics Committee on 132 ASA I & II adult patients (18-55 years of age) scheduled to undergo General Anaesthesia (GA) for elective surgical procedures. Bag mask ventilation (BMV) in these recruited patients was performed by an airway provider with less than 3 years of experience in airway management procedures. A written informed consent was obtained from each patient and airway provider both for participation in the study.

METHOD OF COLLECTION OF DATA

INCLUSION CRITERIA:

- **Patients**: All adults (18-55 years of age), ASA grade I & II, having a Modified Mallampatti Score (MMPS) I & II, with absence of any of the predictors of difficult mask ventilation (DMV) presenting for elective surgeries under general anaesthesia.
- **Airway provider**: Airway providers with less than 3 years of experience in airway management procedures.

EXCLUSION CRITERIA:

- Full stomach patients requiring rapid sequence intubation.
- Predicted difficult airway including DMV [Table 1]
- Pregnant patients
- Haemodynamically unstable patient belonging to ASA 3 and 4
- An airway provider with $\geq$ 3 years of experience in airway management procedures.

TABLE 1: Predictors for difficult Bag Mask Ventilation

PREDICTORS FOR DIFFICULT BMV[28]
1.Age>55 Years
2.BMI>30 Kg /m^2
3.H/O snoring
4. H/O Neck radiation
5.H/O ankylosing spondylitis
6.Facial asymmetry
7.Presence of Beard
8.Bilateral blocked nostrils
9.Edentulous
10.MMP (Modified mallampatti class) >2
11.Upper lip bite test II and III
12.Thyromental distance <6cm
13.Neck circumference >40/42cm (F/M)
14.Decreased range of motion of neck
15.Poor lung/chest compliance

RANDOMISATION AND GROUP ALLOCATION:

A total of 132 patients were recruited after accounting for 10% of dropouts. They were randomly assigned equally into either of the 2 groups A and B by computer generated randomized codes contained in sealed, sequentially numbered envelopes, which were opened by an anesthesiologist not involved in the study.

GROUP A: Comprised of the Patients who underwent BMV with two-handed CE technique of mask ventilation for 2 minutes (24 breaths) by the assigned airway provider.

GROUP B: Comprised of the Patients who underwent BMV with the two –handed Dominant hand (CE) and Non-dominant hand (TE) technique of mask ventilation for 2 minutes (24 breaths) by the assigned airway provider.

METHODOLOGY:

Pre-Procedural Training of Airway providers: After obtaining written consent from participating airway providers, a brief training session comprising of video-demonstration and hands–on skill performance on manikins (Airway management trainer, Laerdal Co. Ltd]) for a period of 30 minutes was conducted by the thesis supervisors prior to inclusion in the study.

Pre-Anaesthesia Check-up of the Patient:

All patients underwent routine thorough pre-anaesthesia check-up comprising of a detailed history including a focused airway history, general physical examination, and focused airway examination to rule out presence of any predictors of DMV. Patients were explained about the study being conducted and written informed consent were taken. Relevant investigations were sent and reviewed. Demographic information and preoperative variables including, age, gender, height, weight, Body mass Index, ASA status were recorded.

Anaesthesia Technique and Study Protocol:

Before starting the study in the operation room (OR), the airway providers were shown a 2-minute video of the technique and were also shown the pictures demonstrating the techniques [Figure 1 A & B].

Figure 1 A: Two handed CE technique of BMV: In this the thumb and the index finger of both hands formed the shape of letter C around the mask attempting to secure mask tightly around patient`s mouth and nose and the other three fingers formed the letter E on the inferior portion of mandible where the little finger provided jaw thrust and middle and ring finger rested on the rim of mandible.[11,14]

Figure 1 B: Two handed Dominant hand CE with Non- dominant hand TE technique: In this technique the dominant hand was used to

perform CE technique and non-dominant hand was used to perform TE technique (in which downward pressure on mask was applied with the thenar eminence while the 4 fingers of each hand pulled the jaw upwards towards the mask.[14]

In the operating room, monitors in the form of pulse oximeter, non-invasive blood pressure (NIBP), 5-lead electrocardiography (ECG), were attached and continuous monitoring of heart rate, ECG rhythm, SpO2 was done. NIBP was recorded at every 1-minute interval. An experienced consultant anesthesiologist not participating in the study was assigned to manage the anaesthesia for the case. A wide bore IV cannula was secured and intravenous injection of Midazolam 0.05mg/Kg was given as premedication. An appropriately sized well-fitting transparent mask was used for each patient. Adequate pre-oxygenation with 100% oxygen at flow rate of 10 L/min was done for 3 minutes. General anaesthesia was induced with 2-3 mg /kg of Propofol, 1.5mg/kg of Lidocaine and 1-2 mcg/kg of Fentanyl intravenously (IV). Neuromuscular blockade (NM-blockade) was established with Inj. Atracurium 0.5mg /kg IV. The anaesthesia machine was preset in pressure control mode (PCV) to deliver 12 breaths /min, peak inspiratory pressure (PIP) of 15 cms of H_2O, an I:E ratio of 1:2, with no positive end expiratory pressure. The consultant anesthesiologist assigned to the case performed BMV to confirm adequate BMV for an initial 1-minute period, before handing over the mask to the designated airway provider to ensure safety of the patient. If this experienced consultant anesthesiologist encountered inadequate BMV, the patient was not included in the study. Inadequate BMV was defined as exhaled tidal volume (VTe) < 4ml/Kg of predicted body weight or less than 150ml per breath with clinical signs like inadequate chest rise, no fogging in the mask, no positive tracing of $EtCO_2$, and/or lack of measurable VTe on anaesthesia ventilator display.[11,16]

After adequate BMV by experienced anaesthesia consultant, the airway provider started with the assigned technique as per random allocation of

the patient. Each airway provider performed the assigned technique for 2 minutes (24 breaths) as described in Figure 1 A/B. The investigator (i.e., the thesis student) recorded all data manually from the anaesthesia machine ventilator display. The protocol was planned to be aborted in case of any observed decrease in SpO_2 to <94% or in the event of any haemodynamic instability. In that case the consultant anesthesiologist intervened and took over the patient management and the data of zero was entered for the remaining breaths of such patient.

After the completion of study, the consultant anesthesiologist assigned for the case continued with further anaesthesia induction and management of the patient as per standard protocol.

OBSERVATIONS:

Exhaled tidal volume (VTe), SpO_2, $EtCO_2$ for each breath was recorded. In addition vital parameters like HR, NIBP, ECG rhythm were also recorded during the period of study.

OUTCOME :

PRIMARY OUTCOME:

Primary outcome analysed in our study was the 2 minute (24 breaths) mean exhaled tidal volume between both mask holding techniques.

SECONDARY OUTCOMES: the secondary outcomes analyzed were as follows**-**

1. Failed Breaths: The number of failed breaths as reflected by no exhaled tidal volume recorded by anaesthesia machine display.

2. Comfortability of both techniques to airway providers: Comfortability level of the airway provider with the use of assigned technique using 5-point Likert scale.

5 –POINT LIKERT SCALE

1.Very comfortable **2**. Comfortable **3**. Neutral **4**. Uncomfortable **5**. Very uncomfortable

SAMPLE SIZE estimation:

The objective of the study was to compare the 2 minute (24 breaths) mean exhaled tidal volume between both the two mask holding techniques by airway providers.

The formula used is as under:

$n = (\sigma 12 + \sigma 22)\ (Z\alpha + Z\beta)^2/(\ m1 - m2)^2$

Where,

$Z\alpha$ = Value of standard normal variate corresponding to α level of significance (1.96)

$Z\beta$ = The standard normal deviate for desired power(0.8416) m = Average

σ = Standard deviation

Based on a study conducted by Gerstein et al[14] the sample size for 95% confidence level & 90% power worked out to be 60 in each group. Hence accounting for 10% dropouts, a sample size of 66 patients in each group was calculated. Hence, we included 66 patients in each group.

STASTICAL ANALYSIS:

Data was described in terms of range; mean ±standard deviation (± SD), frequencies (number of cases) and relative frequencies (percentages) as appropriate. To determine whether the data were normally distributed, a Kolmogorov-Smirnov test was used. Comparison of quantitative variables between the study groups was done using Student t-test and Mann Whitney *U* test for independent samples for parametric and non-parametric data respectively. For comparing categorical data, Chi square ($\chi 2$) test was performed and fisher exact test was used when the expected frequency is less than 5. A probability value (*p* value) less than 0.05 was considered statistically significant. All statistical calculations were done using (Statistical Package for the Social Science)SPSS 21version (SPSS Inc., Chicago, IL, USA)statistical program for Microsoft Windows.

OBSERVATIONS AND RESULTS

In our randomized, prospective study 132 patients were enrolled and divided into two groups (Group A & Group B) for final analysis. The detailed information regarding enrollment and flow of subjects in study protocol is provided in the Consort Flow diagram figure 2. All the patients underwent BMV with the allocated bag mask ventilation technique.

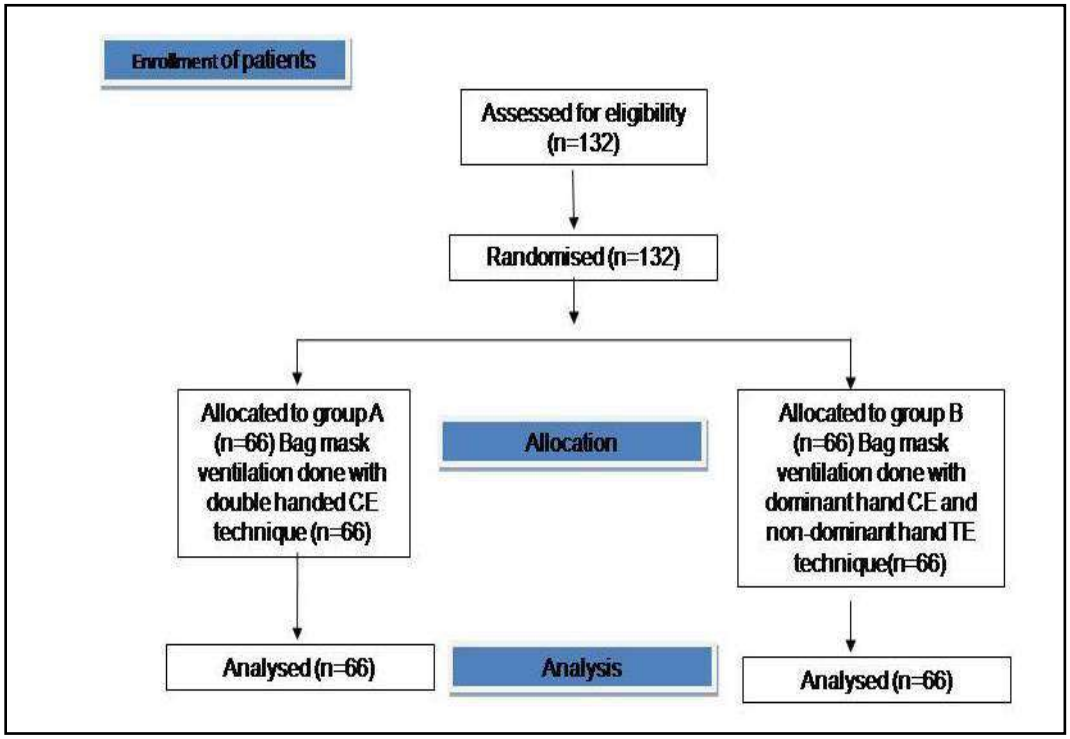
Enrollment of patients
Assessed for eligibility (n=132)
Randomised (n=132)
Allocated to group A (n=66) Bag mask ventilation done with double handed CE technique (n=66)
Allocation
Allocated to group B (n=66) Bag mask ventilation done with dominant hand CE and non-dominant hand TE technique(n=66)
Analysed (n=66)
Analysis
Analysed (n=66)

Figure 2: Consort flow diagram

Table- 2: Comparison of demographic characteristics of the patients of both groups

Characteristics	Group A	Group B	Total	p-value	Chi-square value/t-test
Age (years) Mean (SD)	37.89 (9.15)	35.64 (9.34)		0.163	1.402
Gender [no. of cases/(%age)] Male Female	17/ (25.8%) 49/ (74.2%)	12/ (18.2%) 54/ (81.2%)	29 103	0.293	1.105
ASA physical status[no. of cases/(%age)] 1 2	44/ (66.7%) 22/ (33.3%)	41/ (62.1%) 25/ (37.9%)	85 47	0.586	0.297
Height (cm) Mean (SD)	162.64 (6.78)	162.14 (6.74)		0.671	0.426

Weight(kg) Mean (SD)	62.58 (7.21)	61.20 (7.38)		0.279	1.086
BMI (kg/m^2) Mean (SD)	23.66 (2.03)	23.29 (2.26)		0.316	1.007

The demographic distribution of patients in both groups A & B was comparable with respect to age, gender, ASA physical status, weight, height & BMI

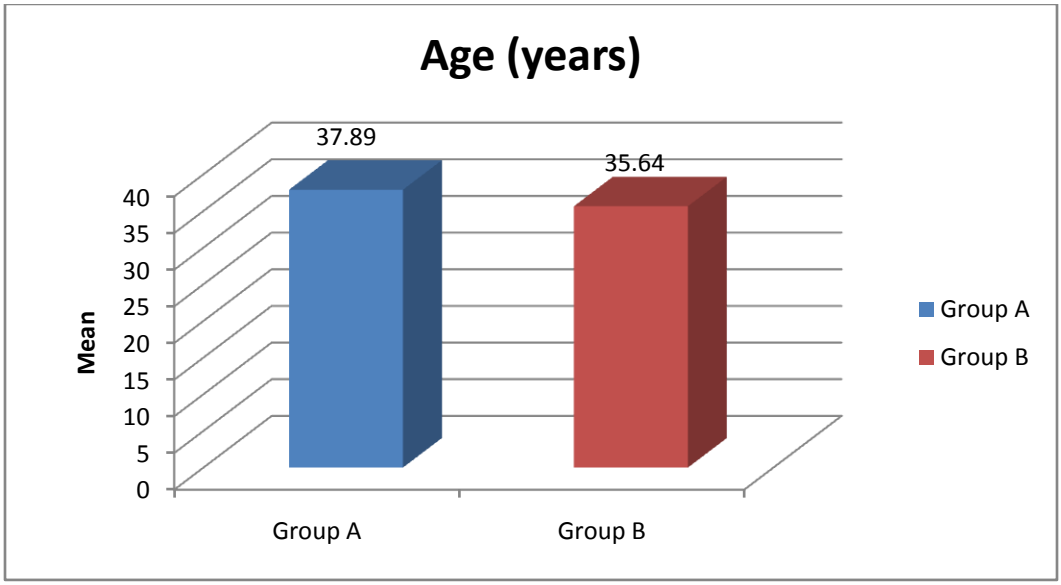

Figure 3: Graphical representation of age of patients of both the groups

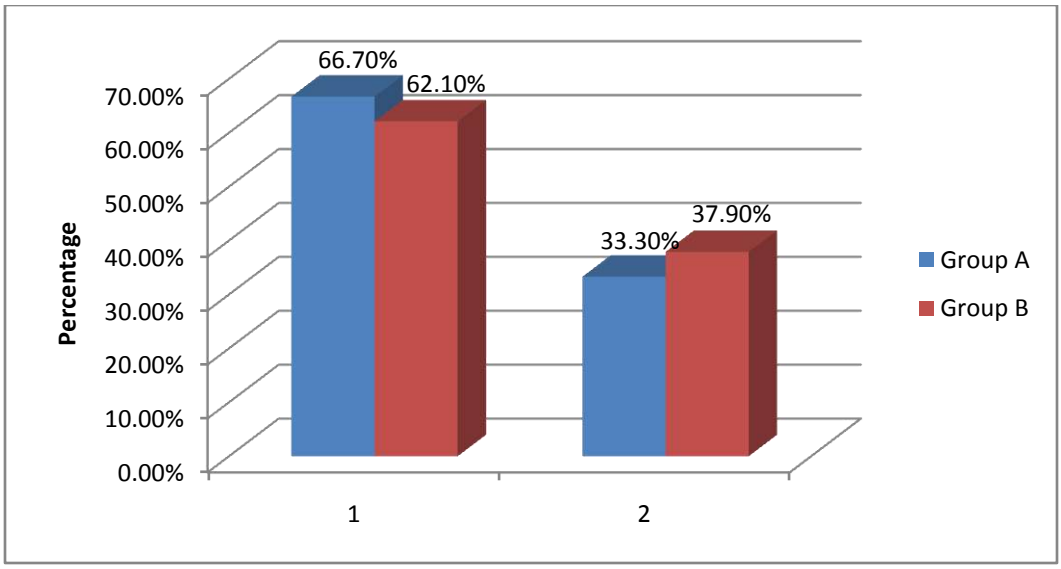

Figure 4: Distribution of ASA Physical status of the patients of both the groups

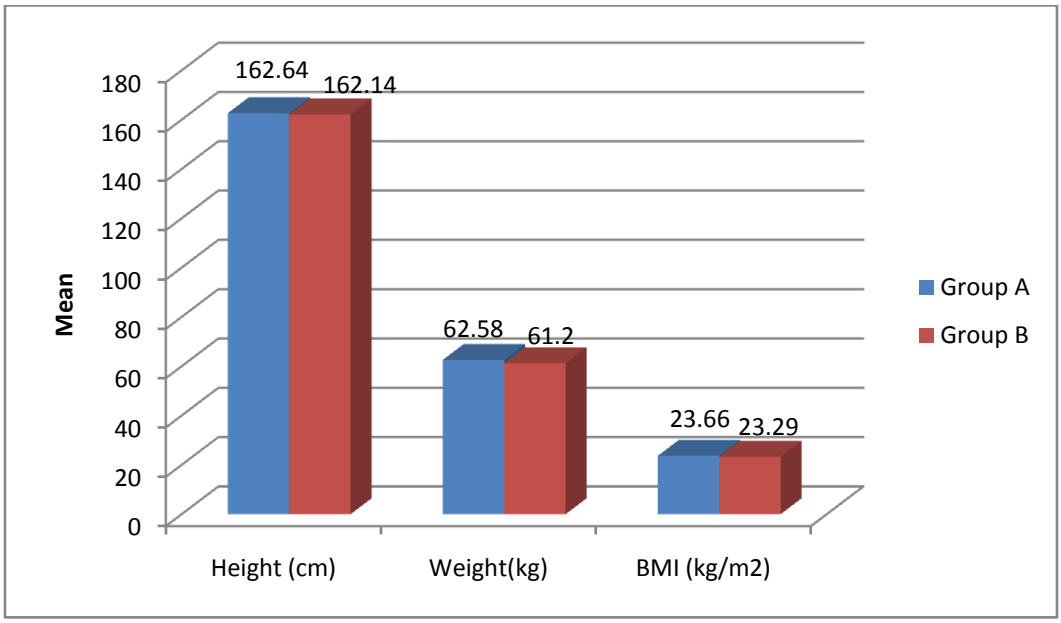

Figure 5 : Graphical representation of height ,weight and BMI of the patients of both the groups

Table -3.Baseline vital parameters of the patients

	Group A		Group B		t	p-value
	Mean	SD	Mean	SD		
Heart rate/min	80.00	7.37	78.50	7.53	1.157	0.250
SBP(mmHg)	122.18	8.23	120.03	7.97	1.526	0.130
DBP(mmHg)	76.76	6.50	76.36	6.57	0.346	0.730
SpO_2%	98.91	0.70	99.09	0.76	-1.435	0.154
RR/min	16.17	1.38	16.17	1.28	0.000	1.000

There were no significant differences observed between the baseline vital parameters of the patients of both the groups.

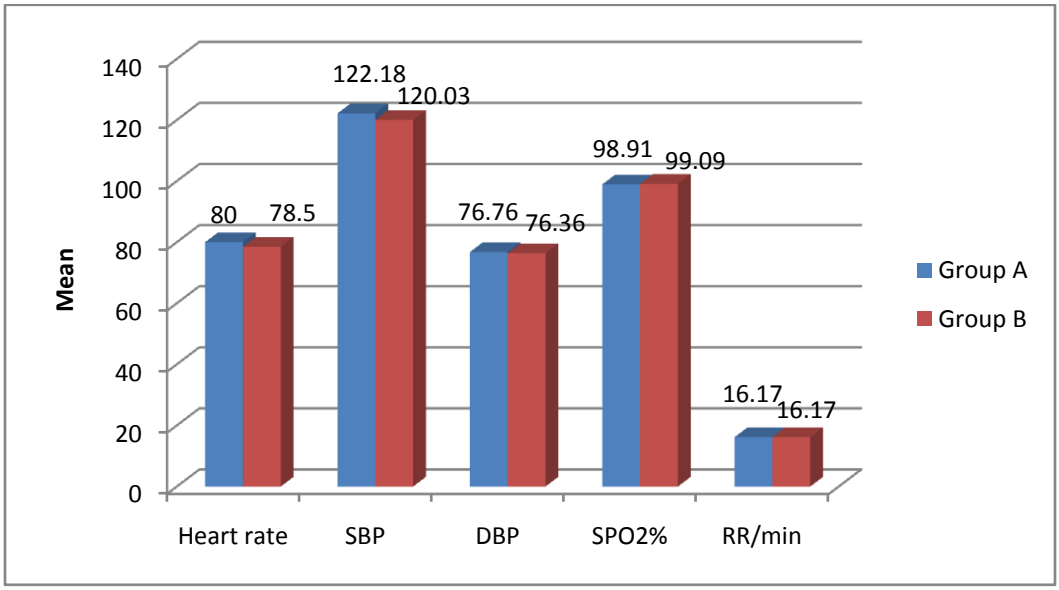

Figure 6 : Baseline vital parameters of the patients of both the groups

Table -4 A. Comparison of the characteristics (Age) of airway providers in both groups

Airway characteristics	Group A		Group B		t	p-value
Age (years)	Mean	SD	Mean	SD	0.151	0.880
	24.39	2.28	24.33	2.32		

The age of airway providers in both the groups was comparable with no significant difference among both groups.

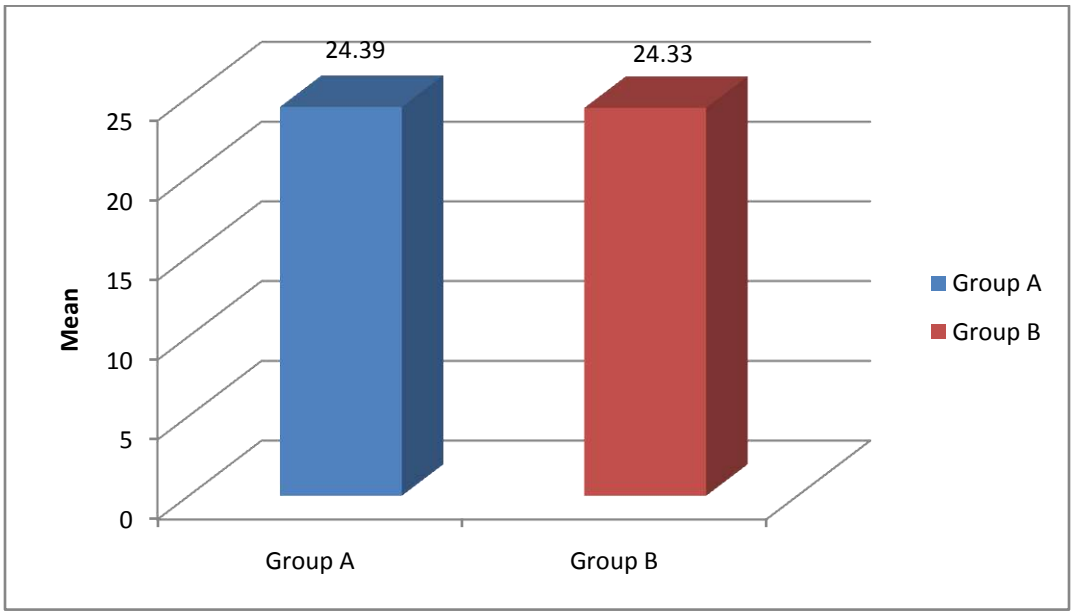

Figure 7: Mean age of the airway providers of both the groups

Table -4 B. Comparison of characteristics of airway providers in both groups

Characteristics	Group A	Group B	Total	Chi square value	p-value
Gender [total number (%age)]					
Female	34(51.5%)	34(51.5%)	68	0.000	1.000
Male	32(48.5%)	32(48.5%)	64		
Specialty & Level of Training of airway provider	No. of cases done/Percentage %)]	No. of cases done/Percentage %)]	Total		
Intern	46/ (69.7%)	46/ (69.7%)	92	0.000	1.000
JR-1	15/ (22.7%)	15/ (22.7%)	30		
JR-3	5/ (7.6%)	5/ (7.6%)	10		

Experience in BMV	Number of airway providers/(%age)	Number of airway providers/(%age)	Total		
10 months	46/ (69.7%)	46/ (69.7%)	92		
1 year	15/ (22.7%)	15/ (22.7%)	30	0.000	1.000
2 years	5/ (7.6%)	5/ (7.6%)	10		

BMV was performed by a total of 66 airway providers (interns, junior residents in Anesthesiology) with an experience of less than three years, who did BMV on assigned patients recruited in the study. Each airway provider was given the opportunity to perform BMV in both A and B groups. There were total 46 interns with experience of about 10 months and 20 Junior Residents (15(JR 1)–first year resident with an experience of 1 year and 5(JR 3) –third year resident with an experience of 2 years). There was no significant difference in the age, level of experience between two groups.

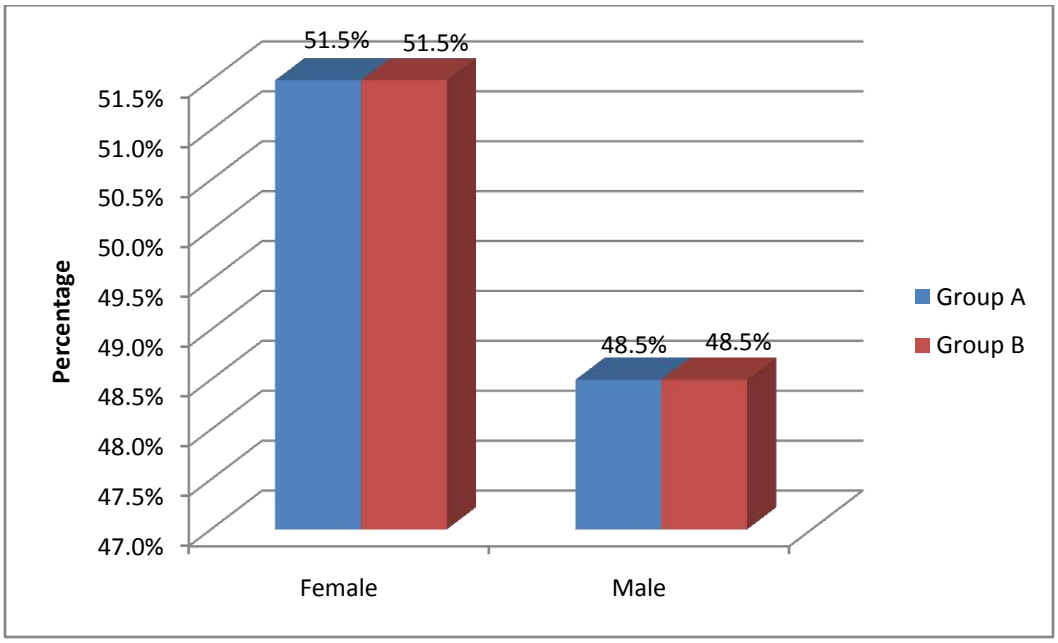

Figure 8: Graphical distribution of airway providers according to their gender .

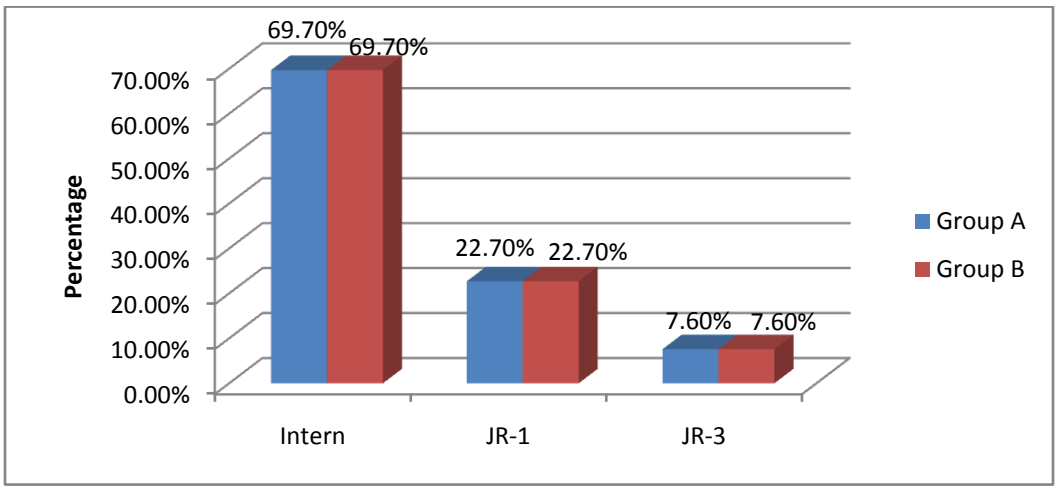

Figure 9: Graphical distribution of specialty & level of training of airway providers

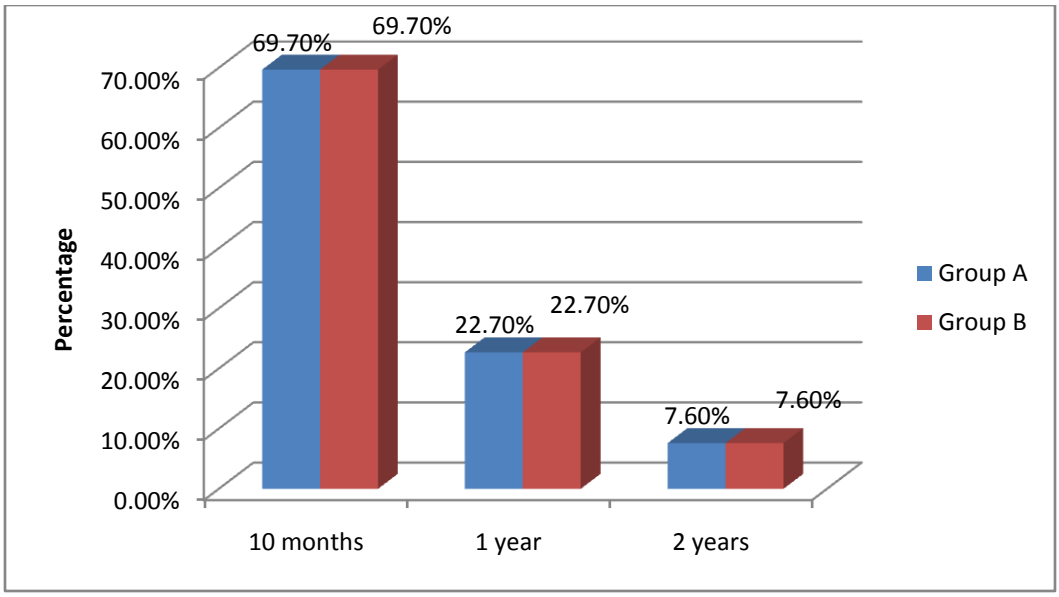

Figure 10: Graphical representation of the percentage of airway providers in terms of their airway experience

Table -5: Comparison of mean exhaled tidal volume and mean $EtCO_2$ of both the groups.

Parameters	Group A	Group B	Z	p-value
Exhaled tidal volume (ml) Mean	377.51	476.71	-5.471	0.001
SD	82.79	121.85		
$EtCO_2$(mm Hg) Mean	28.83	30.42	-4.081	0.001
SD	1.83	2.59		

The mean exhaled tidal volume was compared in both the groups. The mean exhaled tidal volume in group A was 377.51 ml (SD 82.79), whereas mean exhaled tidal volume in group B was 476.71 ml (SD 121.85),which was significantly higher than group A with a difference of 99.2 ml (p value 0.001). The mean $EtCO_2$ in group A was significantly low than group B the mean value in group A is [28.83(SD 1.83) mmHg] and in group B is [30.42 (SD 2.59) mmHg] [p-value 0.001].

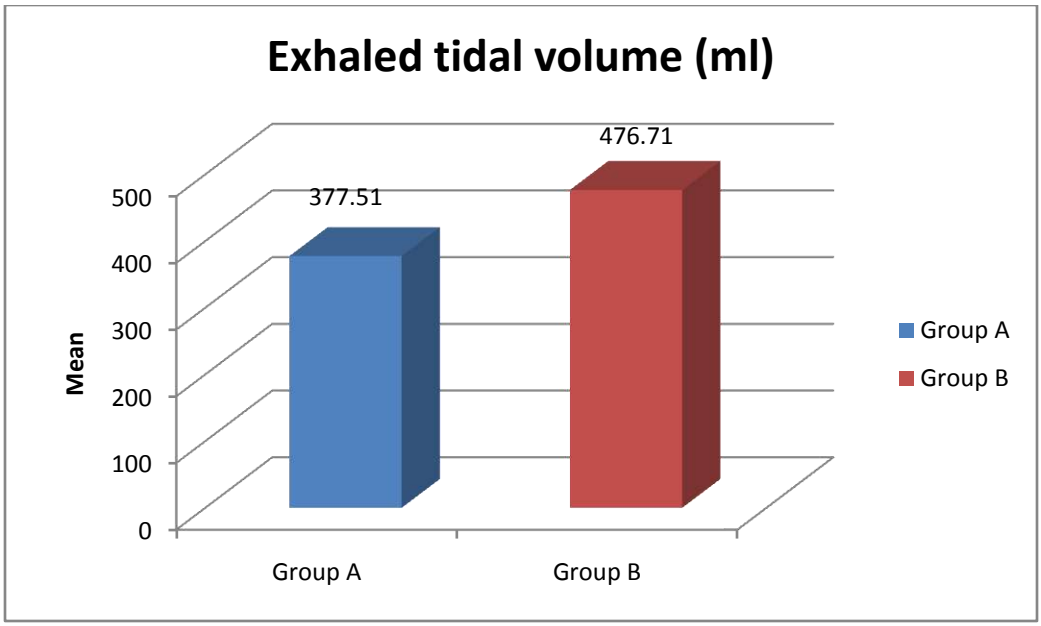

Figure 11: Mean exhaled tidal volume in both the groups

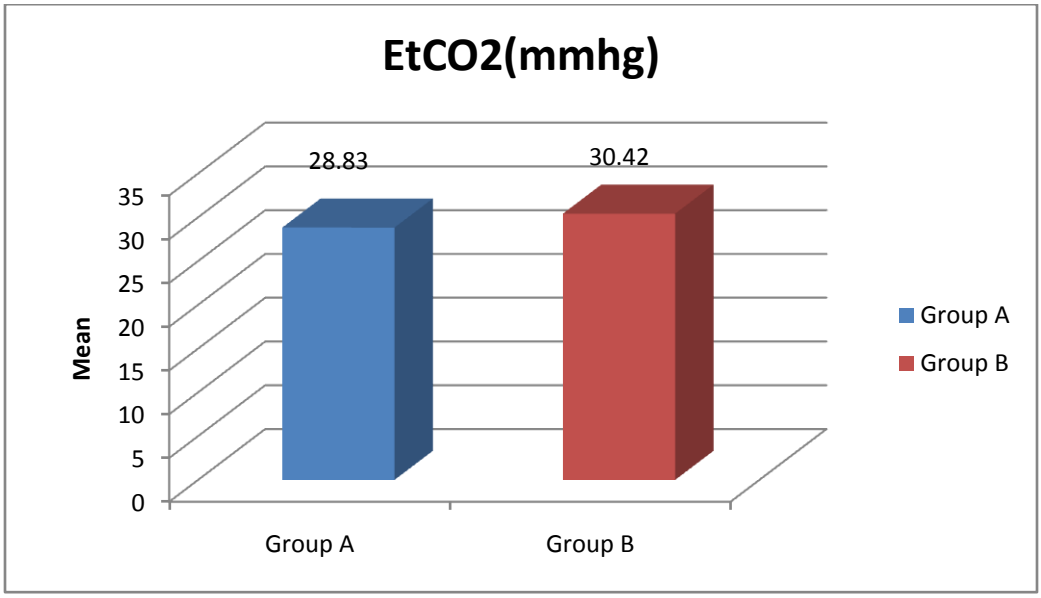

Figure 12 : Mean $EtCO_2$ in both the groups

Table -6: Comparison of comfortability level of both the techniques to the airway providers.

		Group A		Group B		Total	Chi-square value	p-value
		No. of cases	%age	No. of cases	%age			
Airway provider comfortability level (5-point likert scale)	COMFORTABLE	34	51.5%	32	48.5%	65	1.076	0.584
	VERY COMFORTABLE	32	48.5%	33	50.0%	66		
	NEUTRAL	0	0.0%	0	0.0%	0		
	UN-COMFORTABLE	0	0.0%	1	1.5%	1		
	VERY UN-COMFORTABLE	0	0.0%	0	0.0%	0		
Total		66	100.0%	66	100.0%	132		

The BMV with double handed CE technique (group A) was comfortable to 51.5 percent of the airway providers and very comfortable to 48.5 percent of the airway providers, whereas the double handed (dominant hand CE and non-dominant hand TE)-(group B) was very comfortable to 50% of providers and comfortable to 48.5% and one of the airway provider found this technique uncomfortable. None of the airway provider found any of the technique to be neutral or very uncomfortable. Thus, both double handed BMV techniques were almost equally comfortable and there was no significant difference in the comfortability level of both techniques.

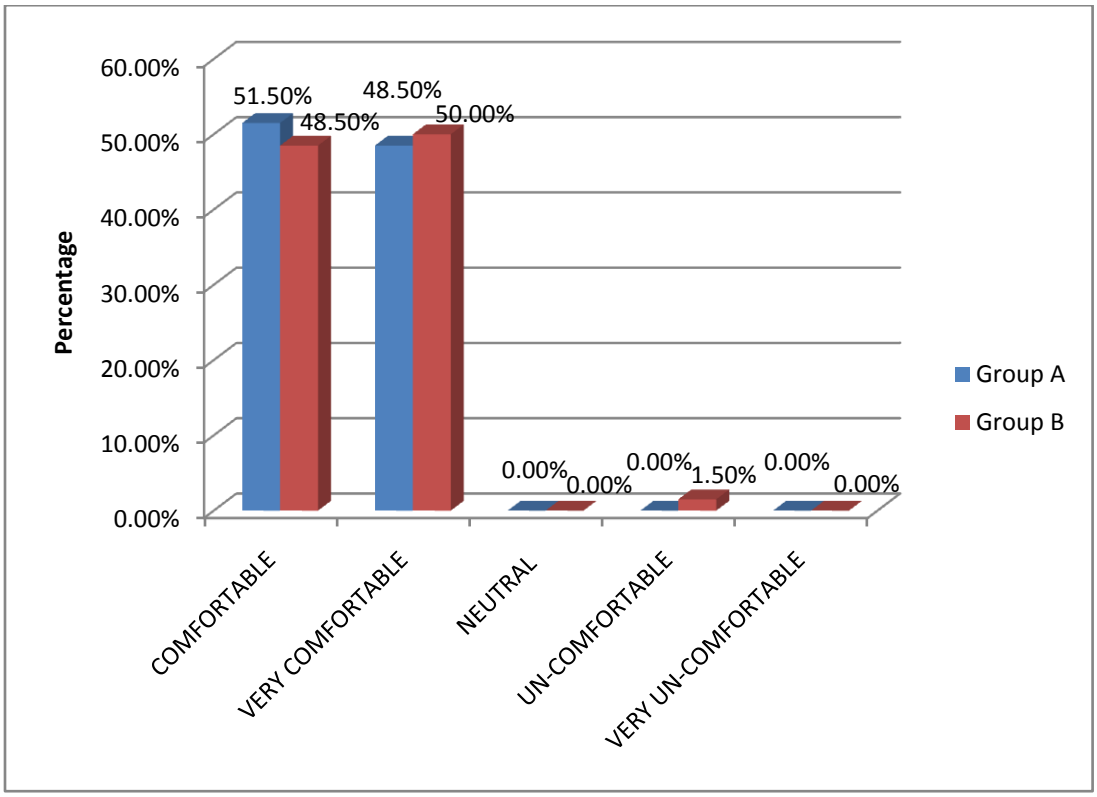

Figure13: Graphical representation of the comfortability level of both the techniques to airway providers

Table -7: Comparison of the number of failed breaths in both the groups

		Group A		Group B		Total no. of patients	Chi-square value	p-value
		No. of patients	%age	No. of patients	%age			
Failed breath(FB)	No	65	98.5%	63	95.5%	128	1.031	0.31
	Yes	1	1.5%	3	4.5%	4		
Number of failed breaths	0	65	98.5%	63	95.5%	128	1.031	0.31
	2	1	1.5%	3	4.5%	4		

Out of the total 132 patients, there were only 4 patients (1 in group A & 3 in group B), each of whom experienced 2 failed breaths. Thus total number of failed breaths were 8 (6 from group B and 2 from group A). Hence there was no significant difference in number of failed breaths in both the groups .

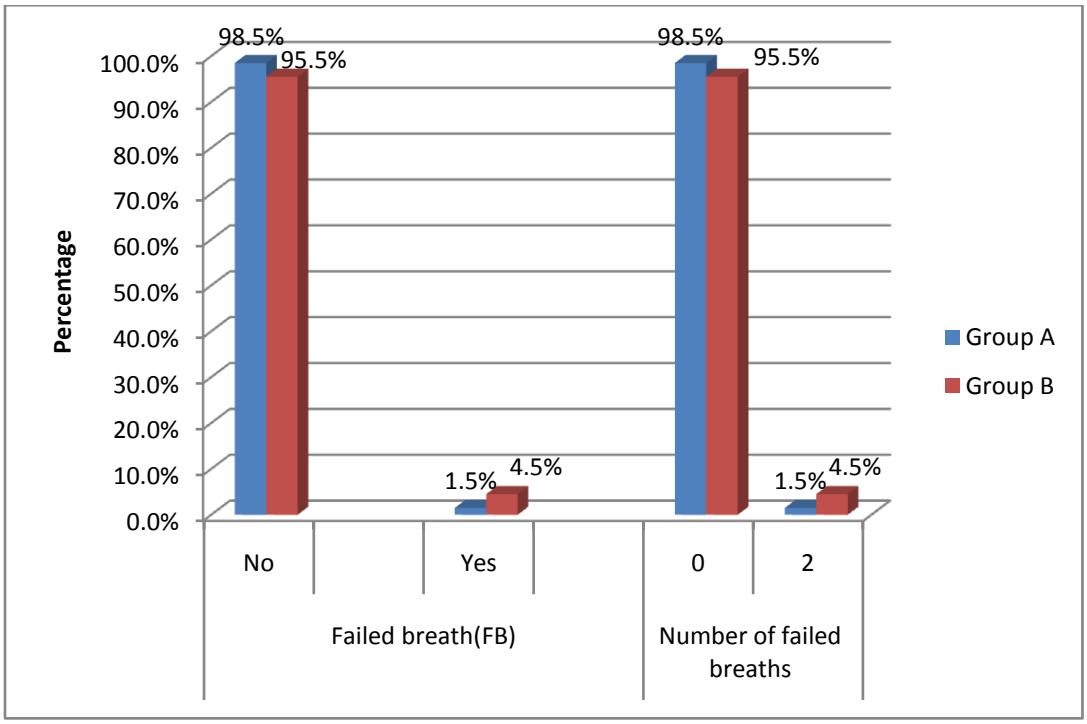

Figure 14 : Distribution of patients with failed breath & number of failed breaths in both the groups

Table- 8. Vital parameters of the patients during the study

Parameters	Group A	Group B	Total	t	p-value
Heart rate/min Mean	76.92	76.71		0.178	0.859
(SD)	(6.51)	(7.02)			
SBP(mm Hg) Mean	118.17	116.28		1.387	0.168
(SD)	(7.47)	(8.18)			
DBP(mm Hg) Mean	72.02	71.12		1.078	0.283
(SD)	(4.46)	(5.13)			
SpO_2 (%) Mean	100	100			
SD	0	0			
ECG rhythm(NSR) No.of cases	66	66	132		
%age	100.0%	100.0%			

The vital parameters of the patients in group A and B were comparable and remained stable with no haemodynamic instability throughout the study period

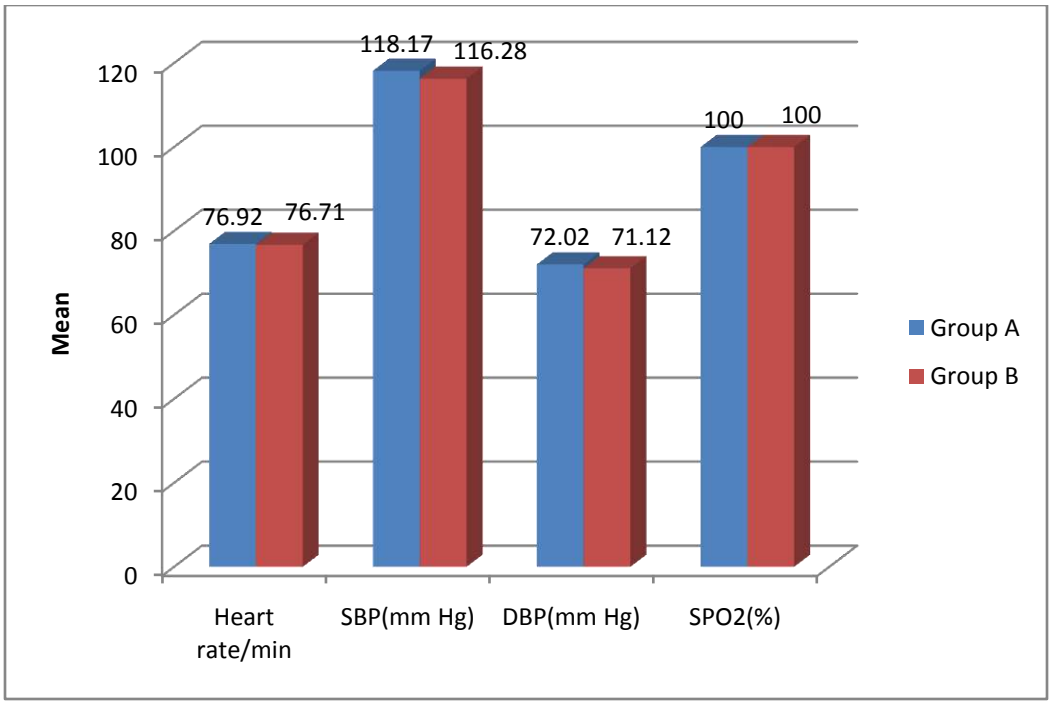

Figure 15 : Graphical representation of vital parameters of patients of both the groups during the study

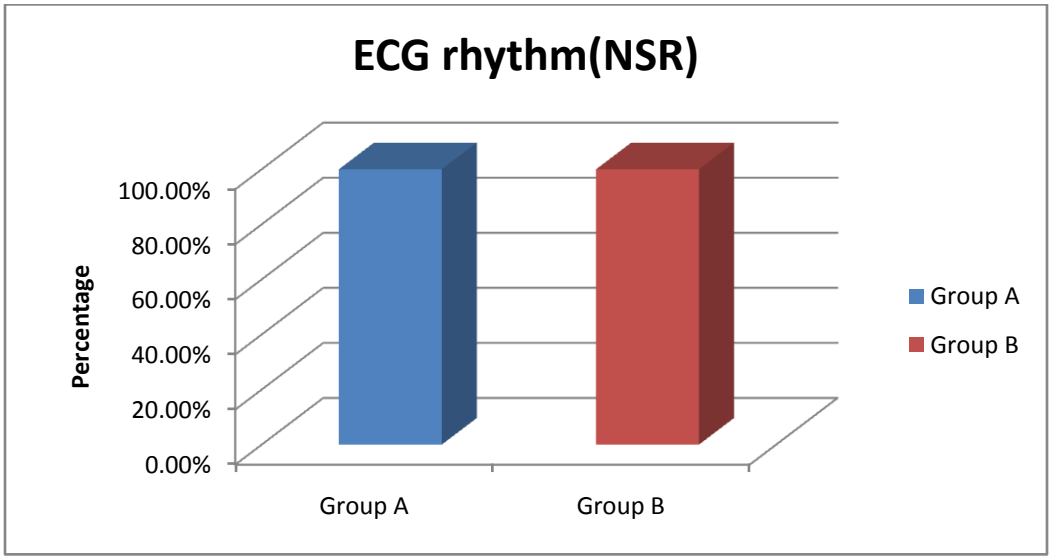

Figure 16 : Graph showing distribution of normal sinus rhythm in both the groups

Table -9. Rescue methods used during BMV (Adjuncts, Experienced operator, LMA)

		Group A		Group B		Total
		No. of cases	%age	No. of cases	%age	
RESCUE METHOD USED	No	66	100.0%	66	100.0%	132
	Yes	0	0.0%	0	0.0%	0
Total		66	100.0%	66	100.0%	132

There was no rescue method used in any case in both the groups.

DISCUSSION

Bag mask ventilation (BMV) is a crucial lifesaving skill. Therefore, it is pertinent that airway providers become proficient in BMV techniques. Effective BMV requires a patent upper airway and an adequate mask seal.[1] This implies that BMV techniques should encompass an appropriate grip of the mask, which does not permit air leaks from the interface between patient's face and mask, along with concomitant continuous maintenance of a patent upper airway.[4-7] Double-handed techniques have been found to be superior in their effectiveness than single-handed BMV techniques.[16,25] Two commonly used two-handed techniques of BMV are the CE and VE (TE) techniques. Previous studies have demonstrated the superiority of two-handed TE technique in terms of exhaled tidal volumes over CE technique in patients with normal airway predictors of BMV, even when performed by beginners.[14] Furthermore the same technique TE (VE) resulted in superior exhaled tidal volumes as compared to the CE technique of BMV in obese unconscious apneic adults. The researchers of this study concluded that bag mask ventilation using the modified V-E technique is more effective such that obese subjects who failed ventilation with the C-E technique were effectively ventilated with the V-E technique.[15]

Though patient characteristics contribute to DMV, inexperience of the operator has been postulated as one of the reasons of failed or inadequate bag mask ventilation.[10,29] Airway managers or healthcare providers should have a good understanding of the tenets of BMV and a reasonable mastery of the skill for sustaining adequate ventilation for prolonged timelines.[13] Hence studies need to focus on techniques that can be optimally accomplished by healthcare providers with variable airway management experience.

Several studies have comparatively evaluated exhaled tidal volumes or adequate chest rise as a measure to assess effectiveness of two-handed techniques of bag mask ventilation in patients and manikins respectively

when performed by both experienced and inexperienced airway providers.[14,15,17] They have postulated that the while CE technique enables effective mask seal on patient's face, the VE/TE techniques enable superior jaw-thrust and maintenance of a patent airway.[15,30] In this context, Soleimanpour et al compared 4 techniques (double handed EC, double handed TE, TE (dominant hand)-EC (non-dominant hand) and TE (non-dominant hand)-EC(dominant hand). All four techniques were executed by both experienced and novices on manikins. They reported enhanced performance of BMV when the novices performed TE (non-dominant hand) - EC (dominant hand) technique. However, the experienced airway provider group exhibited similar efficacy of all techniques to achieve adequate BMV.[17] Translating the advantages of the hybrid technique (TE Non-dominant hand – EC Dominant hand technique) into clinical settings requires repeated comparative trials on human subjects by both experienced and novice providers using objective end-points like exhaled tidal volumes.

Thus, we conducted a randomized prospective study comparing the conventional two-handed CE technique with a hybrid technique of dominant hand CE and non-dominant hand TE technique, on 132 patients who did not have predictors of difficult mask ventilation (DMV) and were planned to undergo elective surgery under general anaesthesia. In our study we included airway providers with an airway management experience of less than 3 years (interns and junior residents of the department of Anaesthesiology). The primary outcome of the study was to comparatively evaluate exhaled tidal volumes generated by each technique when performed by airway providers with variable and limited airway management experience. We ensured safeguards by including patients who did not have any predictors of DMV. This also helped in removing confounders of DMV to influence on effectiveness of the two BMV techniques. Measurement of exhaled tidal volumes rather than assessment of visible chest rise provides an objective endpoint to assess

the success of BMV in anesthetized human subjects.[14] In addition we compared the number of failed breaths and comfortability level of the airway provider as our secondary outcomes. Comfortability is an important measure as more often trainee airway providers may be tasked to provide prolonged period of BMV in emergency settings.

We observed significantly higher exhaled tidal volumes for the 2minute (24 breaths) study period when BMV was accomplished using the hybrid technique {dominant hand CE and non-dominant hand TE} [476.71(SD 121.85) ml] as compared to double handed CE {377.51 (SD 82.79) ml} with mean difference of 99.2ml (p value 0.001) in our study. The higher tidal volumes observed in hybrid technique was further corroborated by the finding of higher end-tidal carbon dioxide levels in the same group B of our study, implying superior ventilation achieved by use of dominant hand CE and non-dominant hand TE technique of BMV.

These results are comparable with results of study conducted by Gerstein et al. These researchers observed a mean tidal volume of 326 $\pm$ 186 ml in all 24 breaths delivered by those randomized to the TE-EC sequence versus a mean tidal volume of 321 $\pm$ 138 ml in patients receiving EC-TE sequence of BMV in their crossover randomized study. Statistically significant higher tidal volumes were generated by TE grip than EC grip, with a mean difference of 110 ml between the two groups of their study. Each technique was done for 1 minute (12 breaths) and a resting period of 10-20 seconds was granted to airway providers prior to crossover to other technique in the same patient.[14] However, in our study each technique was performed for a continuous period of 2 minutes (24 breaths) without any crossover. This enabled singular evaluation of the technique efficiently and perhaps gave us a clue on the comfortable use of these techniques for prolonged period. Furthermore, the relatively higher tidal volumes observed in our study in comparison to other studies could be ascribed to use of neuromuscular blocking agents in our study. The NM blockade used in our study assisted us to overcome the factors of poor chest wall

compliance and ventilator desynchrony. Many trials also indicate that administration of NM Blockade may actually improve face mask ventilation.[16,31]

Our results our also consistent with the study conducted by Maryam Soleimanpour et al who compared the efficacy of the four double handed techniques (EC, Thenar eminence, Thenar eminence (dominant hand)-EC (non-dominant hand) and Thenar eminence (non-dominant hand)- EC (dominant hand) of mask ventilation in the two groups of experienced and novice staff on manikins. They concluded that novice group performed Thenar–eminence (nondominant hand)–EC (dominant hand) technique better than the other techniques.[17] In our study the hybrid technique (dominant hand CE –non dominant hand TE) also resulted in better ventilation when performed by airway providers with limited airway management experience on human subjects. However, in the experienced group of providers, Maryam Soleimanpour et al did not observe any significant difference between all techniques. The limitation of their study was that the assessment of the ventilation quality was completely subjective as they assessed the ventilation by chest expansion in manikins and provided different scores according to the quality of chest expansion ranging from no appreciable chest expansion to good chest expansion.[17]

Our literature search did not reveal any randomized study in which the hybrid technique (dominant hand CE –non dominant hand TE) was performed and compared with CE technique on human subjects. The two-handed hybrid technique (dominant hand CE and non-dominant hand TE technique) used in our study provides effective jaw thrust displacing the mandible anteriorly thus improving the patency of the airway, while the dominant hand CE & Non- dominant hand TE both ensure an air-tight seal at the mask face interface. Various studies [15,30] have postulated that a positive pressure is generated by TE technique which pushes the

submandibular tissue anteriorly resulting in relief of upper airway obstruction and thus providing higher tidal volumes at lower pressures. Thus, by combining both CE and TE in our technique we sought to combine the benefits of the traditional CE technique and novel TE technique and avoided any compression of the submandibular space which might occur when a CE technique of BMV is employed singularly.

Our results contrast with the results of the study conducted by Hart D et al comparing three techniques (one-hand C-E technique, two-hand C-E technique and two-hand V-E technique) of face mask ventilation. They obtained higher Vte with two-handed C-E technique (550.8 ml) as compared to the two-handed V-E technique (538 ml) ($p < 0.001$).[13] This variability may be attributed to the mannequin-based nature of the study and hence their results cannot be extrapolated directly to human subjects.[25]

We compared the comfortability level of both the techniques to the airway providers who performed both techniques during the study period, using a 5- point Likert scale as our secondary outcome. We found that both the techniques were not significantly different in regard to comfortability level. The double handed CE technique was comfortable to 51.5% of airway providers and very comfortable to 48.5%, whereas the hybrid technique was very comfortable to 50% of providers and comfortable to 48.5%.

These results of the comfortability level to the airway providers were in contrast with a study conducted by Althunayyan et al.[1] They found that CE technique was superior to VE technique in terms of comfortability. However, their study participants were experienced respiratory therapists who performed BMV on a simulated model which explains their comfortability scores with traditional CE techniques on simulated models. Manikins or simulated models offer similar conditions and do not exhibit variability in terms of chest wall compliance or other patient related factors. In addition, the limited exposure to BMV in the relatively inexperienced providers of our study, may perhaps make it difficult for

them to subjectively differentiate between various comfortability scores.

We also compared the number of failed breaths between two techniques as our secondary outcome and observed that there were total 8 failed breaths (in 4 patients out of 132 cases) among which 6 failed breaths were in the B group and 2 from the group A. However, this difference could not either attain statistical or clinical significance. Gerstein et al also compared the failed breaths in both techniques CE and TE. They found that with TE grip the subjects averaged 0.9 failures per 12 breaths and in the EC grip the number of failures increased to 2.3 failure per 12 breaths and this difference of failed breaths between groups of their study was significant [14].The lesser number of failed breaths in our study can be secondary to inclusion of patients without predictors of DMV. Furthermore our study was not powered adequately to detect differences for this secondary outcome.

There are few limitations in our study. Our study could not be blinded; hence both the airway provider and the thesis student were aware of the technique. In addition, as we performed the study in controlled settings of elective surgical patients, we cannot translate them to emergency scenarios. Future studies evaluating their efficacy in emergency triage settings can perhaps validate their usefulness further.

In conclusion the hybrid technique (Dominant hand CE and non-dominant hand TE) resulted in higher tidal volumes when used on human subjects by relatively inexperienced airway providers. Thus, this may be recommended as an alternative preferred BMV technique by providers with variable airway management experience.

SUMMARY AND CONCLUSION

1. We compared the effectiveness of two handed CE and dominant hand CE – non-dominant hand TE technique of BMV in a prospective, randomised study conducted on 132 ASA I-II adult patients (18-55 years) without any predictors of difficult mask ventilation who were scheduled for elective surgery under general anaesthesia.

2. An airway provider with airway experience of less than 3 years were given training of both the techniques through pictures and videos.

3. Patients were enrolled and randomly allocated into two study groups (A and B) of 66 patients each. Patients in group A were ventilated with CE technique by assigned airway provider. In group B, patients were ventilated with dominant hand CE –non-dominant hand TE techniques of BMV by the assigned airway provider.

4. Ventilator was pre-set to PCV mode to deliver 12 breaths per minute, peak inspiratory pressure of 15 cms of H_2O, I:E ratio of 1:2 with no positive end-expiratory pressure.

5. After induction of anaesthesia and administration of neuromuscular blocking agent, BMV was performed by an airway provider with an experience of less than 3 years.

6. Primary outcome analyzed in our study was 2 minute (24 breaths) mean exhaled tidal volume of both the groups and secondary outcomes were the number of failed breaths (no exhaled tidal volume recorded by anaesthesia machine) and comfortability level of airway provider with the use of assigned technique using 5 -point Likert scale

7. We observed a statistically significant higher mean exhaled tidal volume in dominant hand CE –non-dominant hand TE technique as compared to CE technique thereby validating superiority of dominant hand CE –non-dominant hand TE technique over two handed CE technique of BMV.

8. Mean exhaled tidal volume with dominant hand CE –non-dominant hand TE technique was {476.71(SD 121.85) ml} as compared to double handed CE {377.51 (SD 82.79)ml} with mean difference of 99.2ml (p

value 0.001).

9.The mean $EtCO_2$ in group A was significantly lower than group B, the mean value in group A was [28.83 (SD 1.83) mmHg]and in group B was [30.42 (SD 2.59)mmHg] [p value 0.001] which means that dominant hand CE –non-dominant hand TE technique provides more adequate ventilation

10. We compared the comfortability level of both the techniques to the airway providers on a 5- point Likert scale as our secondary outcome. Both the techniques were comparatively comfortable to providers with limited airway management experience in our study.

12. We also compared the number of failed breaths between two techniques as our secondary outcome and found that there were total 8 failed breaths (in 4 patients out of 132 cases) among which 6 failed breaths were from the B group and 2 from the group A. However, this difference did not attain statistical difference

13. **In group A-**

-The 24 breaths mean tidal volume of 66 patients was 377.51 (SD 82.79) ml

-There was only 1 patient among 66 patients who had failed breath (number of failed breath =2)

14. **In group B** –

- The 24 breaths mean tidal volume of 66 patients was 476.71(SD 121.85) ml

-There were 3 patients among 66 patients who had failed breaths (total 2 failed breaths per patient, hence total failed breaths were 6)

15. In conclusion we observed that dominant hand CE and non-dominant hand TE technique provided effective ventilation than the two handed CE technique of BMV when performed by airway providers who are less experienced in airway management techniques.

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S. No.	MRD No.	Group	Age of the patient	Gender	Height (Cm)	Weight (Kg)	BMI (Kg/M²)	ASA physical status	Comorbidity	H/o Difficult BMV	H/o Snoring (yes/no)	H/o Neck radiation (yes/no)	H/o Ankylosing spondylitis (yes/no)	Dentition	Bearded	Nasal patency test	Mouth opening (Cm)	Thyromental distance (<6cm)	Neck movement (80-90deg/<80 deg)	Neck circumference >40/42 cm(F/M)	TMJ mobility (adequate / restricted)	ULBT	MMPS	Abnormal face, neck, airway anatomy
			Patient's demographics																					
1	1138248	B	55	F	160	60	23.43	2	NO	NO	NO	NO	NO	1 missing teeth	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
2	1136879	B	24	F	152	58	23.57	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
3	1138912	B	35	F	160	62	24.21	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
4	1139582	B	47	F	167	70	25.17	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
5	1139536	B	22	F	157	49	19.91	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
6	1138845	A	50	F	162	68	25.95	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
7	1139621	B	33	F	160	58	22.65	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
8	1140209	B	30	M	172	73	24.74	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
9	520367	B	27	F	157	52	21.13	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
10	1140269	B	29	M	182	60	18.12	1	NO	NO	NO	NO	NO	Full	NO	patent	5.5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
11	1140392	A	43	F	162	68	25.95	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	1	NO
12	1140791	A	33	F	165	68	25	1	NO	NO	NO	NO	NO	Full	NO	patent	5.4	NO	80-90 DEGREE	NO	Adequate	1	2	NO
13	773061	A	33	M	170	70	24.22	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
14	214197	A	44	F	157	62	25.2	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
15	8224	B	32	F	152	43	18.6	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5.4	NO	80-90 DEGREE	NO	Adequate	1	1	NO
16	1141081	B	30	F	154	58	24.47	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
17	37863	A	50	F	154	61	25.73	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	1	NO
18	1141851	B	26	F	162	60	22.9	1	NO	NO	NO	NO	NO	Full	NO	patent	5.5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
19	1142539	A	30	F	157	62	25.2	2	NO	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
20	1142787	B	37	F	162.5	66	25.19	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
21	1142811	B	27	F	160	62	24.21	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
22	262995	B	45	M	172	76	25.76	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
23	1144187	A	36	F	157	61	24.79	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
24	1139900	B	45	F	157	55	22.35	2	HYPERTENSION	NO	NO	NO	NO	1 missing teeth	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
25	1145778	B	34	M	175	75	24.5	1	NO	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
26	848879	A	37	F	157	61	24.79	2	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
27	835205	B	36	F	160	66	25.78	2	RA	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
28	1145656	A	40	F	154.9	61	25.73	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
29	540861	B	38	F	162	67	25.57	1	NO	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
30	1146734	A	37	F	160	65	25.39	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
31	1147315	A	30	F	157	50	20.32	1	NO	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	1	NO
32	430418	B	46	F	157	63	25.6	2	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
33	1149039	B	36	F	155	62	25.83	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
34	1013290	A	49	F	160	60	23.43	1	NO	NO	NO	NO	NO	1 lower incisor missing	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
35	1147672	B	38	F	157	63	25.6	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
36	1148157	A	43	F	155	56	23.33	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
37	1149991	B	43	M	167	65	23.38	2	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
38	1150571	A	45	M	170	75	25.95	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
39	1152655	B	45	F	157	59	23.98	2	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
40	1152426	B	45	F	157	63	25.6	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
41	120948	A	32	F	162	57	21.75	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
42	552451	B	33	F	152.4	60	25.97	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	1	NO
43	1149328	B	52	M	172.7	75	25.4	2	NO	NO	NO	NO	NO	2 Misssing teeth	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
44	1120549	A	30	M	162	55	20.99	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
45	218363	B	44	F	162	65	24.8	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
46	1156277	A	35	F	157	63	25.6	2	DIABETIC	NO	NO	NO	NO	Full	NO	patent	5.5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
47	1157635	A	29	F	160	60	23.43	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO
48	1155186	A	27	M	170	68	23.52	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
49	1152160	A	42	F	162	65	24.8	2	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
50	1156337	B	33	F	157	56	22.76	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
51	1157114	A	32	F	160	55	21.48	1	NO	NO	NO	NO	NO	Full	NO	patent	4.9	NO	80-90 DEGREE	NO	Adequate	1	1	NO
52	1157450	B	48	F	165.1	65	23.89	2	DIABETIC	NO	NO	NO	NO	1 missing teeth	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
53	660239	A	31	F	160	65	25.39	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
54	1158829	B	52	F	160	60	23.43	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
55	1139649	B	47	M	167.6	70	25.17	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
56	1162177	B	34	F	160	65	25.39	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5.5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
57	1161487	A	49	F	160	65	25.39	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	1	NO
58	623345	A	50	F	160	63	24.6	2	HYPOTHROID	NO	NO	NO	NO	1 missing teeth	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	1	NO
59	645900	A	44	F	157.5	62	25.2	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
60	1165209	A	23	M	175	70	22.87	1	NO	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
61	4494	A	44	F	160	64	25	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
62	1151763	B	24	M	180	65	20.06	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
63	1165524	A	49	F	157	62	25.2	2	DIABETIC	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	1	NO
64	802035	A	43	F	157	54	21.95	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
65	1167495	B	31	F	162	67	25.57	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
66	223237	A	40	M	175	75	24.5	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
67	612117	B	42	F	167	70	25.17	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO

S. No.	MRD No.	Base line vital parameters of patients				Age of airway provider (years)	Gender	Speciality and level of training of airway provider	Experience of airway provider in BMV	TV1	TV2	TV3	TV4	TV5	TV6	TV7	TV8	TV9	TV10	TV11	TV12	TV13	TV14	TV15	TV16	TV17	TV18	TV19	TV20	TV21	TV22	TV23	TV24	$EtCO_2(1)$	$EtCO_2(2)$	$EtCO_2(3)$
		Heart rate/min	NIBP(mm hg)	SpO_2%	RR/min																															
1	1138248	86	130/82	100	16	23	Male	Intern	10 MONTHS	420	380	382	382	450	452	452	453	450	451	452	453	454	455	456	456	457	460	453	450	438	439	440	441	30	30	29
2	1136879	80	110/70	100	14	23	Male	Intern	10 MONTHS	580	581	582	583	584	582	583	584	584	585	586	586	578	576	577	576	570	571	571	570	570	571	571	570	30	31	32
3	1138912	89	130/70	99	16	38	Female	JR-1 YEAR	1 YEAR	482	485	486	486	487	488	489	500	501	500	502	502	502	502	500	489	490	491	490	492	490	492	494	495	32	32	32
4	1139582	61	128/68	100	16	23	Male	Intern	10 MONTHS	420	425	426	424	423	424	424	426	427	428	426	427	428	435	436	450	451	448	446	444	450	451	452	451	29	30	30
5	1139536	84	130/80	99	18	23	Male	Intern	10 MONTHS	280	282	284	300	302	303	340	341	342	342	343	345	346	346	350	351	352	350	351	352	353	352	353	352	28	28	28
6	1138845	69	110/60	99	15	23	Male	Intern	10 MONTHS	290	300	310	300	288	300	302	304	310	320	324	330	324	325	326	324	325	324	325	325	310	324	316	324	29	28	28
7	1139621	70	110/70	100	16	26	Female	JR-1 YEAR	1 YEAR	420	422	420	422	420	421	422	423	424	424	425	426	425	450	451	452	450	451	425	420	421	425	426	420	30	30	30
8	1140209	80	112/72	100	15	28	Female	JR-1 YEAR	1 YEAR	330	332	340	340	341	355	400	410	412	404	410	402	410	440	440	442	441	439	435	432	433	432	444	446	31	30	31
9	520367	80	110/72	99	16	24	Female	JR-1 YEAR	1 YEAR	322	322	335	340	344	350	351	300	295	296	296	299	300	305	306	320	322	323	322	326	326	330	326	326	30	29	30
10	1140269	82	130/82	99	16	25	Male	JR-1 YEAR	1 YEAR	320	322	324	320	321	322	324	324	340	344	344	340	340	350	355	380	384	384	382	384	385	385	386	386	30	28	29
11	1140392	72	110/70	98	14	22	Male	Intern	10 MONTHS	280	289	290	290	300	302	303	304	305	310	310	312	312	314	320	322	324	325	320	322	321	319	320	320	28	28	29
12	1140791	78	112/72	98	16	24	Male	Intern	10 MONTHS	490	495	490	492	490	494	485	486	484	482	484	482	486	484	484	486	486	490	492	490	490	492	490	491	28	28	29
13	773061	73	110/72	98	16	23	Male	Intern	10 MONTHS	290	294	295	300	340	344	342	344	342	338	336	334	334	332	333	332	340	340	341	320	322	324	324	320	27	27	28
14	214197	82	110/80	98	16	23	Male	Intern	10 MONTHS	380	380	374	374	372	370	372	370	350	352	354	354	355	356	355	360	362	362	363	364	365	366	367	368	29	29	30
15	8224	74	120/82	99	16	23	Male	Intern	10 MONTHS	450	452	450	455	456	454	455	450	454	460	480	475	470	460	465	464	446	430	450	452	442	450	450	456	30	30	31
16	1141081	62	110/72	99	14	26	Female	JR-1 YEAR	1 YEAR	0	0	200	205	220	218	225	240	245	239	240	245	260	290	298	300	298	299	300	302	304	318	316	314	0	0	26
17	37863	90	110/70	99	15	24	Female	JR-1 YEAR	1 YEAR	320	324	326	326	324	325	330	334	345	338	340	342	340	341	342	340	341	342	344	340	341	342	350	351	28	27	28
18	1141851	82	120/72	100	14	28	Male	JR-3 YEAR	2 YEARS	390	394	380	340	344	346	350	352	352	351	344	345	350	354	344	330	324	325	326	324	325	340	333	344	27	28	28
19	1142539	86	118/70	99	16	26	Female	JR-1 YEAR	1 YEAR	300	299	290	299	280	299	300	301	302	302	303	302	302	304	305	310	311	312	312	315	320	324	324	324	27	28	28
20	1142787	74	110/80	99	14	27	Female	JR-3 YEAR	2 YEARS	624	648	640	548	546	548	590	600	601	602	604	601	610	620	610	609	608	610	612	610	611	612	610	611	36	36	35
21	1142811	84	108/68	100	15	26	Female	JR-1 YEAR	1 YEAR	320	319	320	321	322	320	299	300	301	302	303	302	301	300	301	300	301	300	300	302	310	312	314	315	29	28	28
22	262995	72	118/78	98	16	26	Female	JR-1 YEAR	1 YEAR	388	378	376	377	376	376	380	384	386	384	382	384	382	382	378	376	374	374	374	375	376	376	376	376	30	31	29
23	1144187	90	119/86	99	17	27	Male	JR-1 YEAR	1 YEAR	300	299	298	299	280	282	284	285	286	299	299	300	301	302	302	304	303	304	310	311	310	311	310	308	27	28	28
24	1139900	90	130/90	99	18	28	Female	JR-3 YEAR	2 YEARS	651	640	649	649	649	650	646	644	642	643	642	642	642	642	642	643	642	642	642	644	642	644	644	642	33	32	33
25	1145778	82	110/70	100	16	27	Male	JR-1 YEAR	1 YEAR	550	540	541	542	544	550	544	545	546	544	546	547	548	549	550	551	545	544	545	546	540	545	545	540	30	31	30
26	848879	78	110/70	100	18	23	Male	Intern	10 MONTHS	314	389	411	418	411	410	399	334	370	306	368	418	420	419	466	457	420	466	457	450	452	452	457	457	32	30	31
27	835205	86	130/90	99	16	26	Female	JR-1 YEAR	1 YEAR	647	645	645	653	656	655	656	654	655	654	660	670	671	672	660	670	671	672	666	678	676	676	677	678	34	33	33
28	1145656	84	120/72	98	16	28	Female	JR-3YEAR	2 YEARS	650	652	675	630	631	631	632	630	631	632	633	634	633	632	633	634	633	634	633	640	641	642	640	641	33	32	33
29	540861	66	120/82	97	14	27	Female	JR-1YEAR	1 YEAR	440	441	440	438	436	434	432	430	428	426	426	426	440	441	442	440	438	439	440	438	437	436	437	430	29	30	30
30	1146734	72	110/80	98	14	27	Female	JR-1YEAR	1 YEAR	450	452	455	450	455	450	451	450	451	424	424	425	426	427	428	429	420	418	420	421	420	422	424	424	30	30	31
31	1147315	90	110/70	98	18	26	Female	JR-1YEAR	1 YEAR	325	326	300	299	288	288	289	300	301	302	300	300	300	300	302	299	300	298	288	282	284	282	284	285	27	28	27
32	430418	80	110/72	99	16	26	Female	JR-1 YEAR	1 YEAR	550	548	548	540	542	530	580	581	578	566	565	564	565	564	565	566	567	568	588	590	584	586	566	570	31	30	30
33	1149039	78	120/82	99	14	25	Female	JR-1YEAR	1 YEAR	0	0	208	247	250	261	278	300	301	302	310	312	314	312	313	314	315	320	340	328	341	338	339	340	0	0	24
34	1013290	82	110/70	99	16	25	Female	JR-1YEAR	1 YEAR	550	520	521	544	532	534	550	532	534	532	534	535	540	541	555	550	560	545	546	547	550	560	561	560	32	33	32
35	1147672	68	120/80	100	16	25	Male	JR-1 YEAR	1 YEAR	640	644	645	640	642	644	645	650	651	652	646	647	650	666	644	640	642	640	642	640	641	640	644	645	32	33	33
36	1148157	88	120/78	98	13	23	Male	Intern	10 MONTHS	230	228	0	0	225	230	240	300	301	299	300	298	306	310	311	308	309	310	318	340	338	328	330	332	25	24	20
37	1149991	88	120/82	99	15	23	Male	Intern	10 MONTHS	550	552	550	552	554	556	554	556	560	561	562	566	567	566	567	568	580	570	575	576	576	570	588	590	34	33	33
38	1150571	62	130/80	98	14	24	Male	Intern	10 MONTHS	220	225	230	234	235	220	245	230	235	234	235	236	237	238	239	235	236	237	238	238	230	231	235	240	26	25	25
39	1152655	90	110/60	99	16	24	Male	Intern	10 MONTHS	420	422	423	420	422	420	422	420	419	420	422	420	418	420	420	422	420	421	420	440	450	450	451	452	30	31	30
40	1152426	72	120/82	99	18	23	Male	Intern	10 MONTHS	350	351	352	350	351	350	348	348	350	351	351	348	350	351	348	346	348	346	347	348	348	347	346	350	29	28	29
41	120948	74	110/72	99	16	23	Male	Intern	10 MONTHS	512	510	512	510	520	521	522	524	525	524	524	540	544	541	542	541	541	540	536	534	535	536	540	541	32	32	33
42	552451	67	120/82	100	16	23	Female	Intern	10 MONTHS	480	482	480	481	482	480	481	476	477	476	477	478	478	479	480	481	482	482	482	485	486	487	488	487	30	31	30
43	1149328	78	110/78	99	16	23	Female	Intern	10 MONTHS	350	358	408	438	400	385	377	378	376	380	390	402	400	402	398	399	400	401	402	400	398	399	400	402	29	28	29
44	1120549	90	130/78	99	18	24	Female	Intern	10 MONTHS	352	350	351	352	348	332	350	352	342	343	344	345	355	350	352	360	366	377	380	352	353	354	355	350	30	30	30
45	218363	68	120/66	98	18	25	Female	Intern	10 MONTHS	652	650	655	650	655	660	661	662	661	662	665	665	660	670	666	640	642	642	642	644	650	655	656	658	31	32	33
46	1156277	79	121/78	98	16	24	Female	Intern	10 MONTHS	350	351	352	353	354	320	324	299	298	299	300	301	302	300	302	304	305	310	320	321	340	340	350	351	29	28	29
47	1157635	82	130/80	99	15	23	Female	Intern	10 MONTHS	420	422	440	441	442	450	444	445	446	450	451	426	427	428	429	430	431	432	433	434	435	436	437	438	29	30	31
48	1155186	98	130/82	99	16	24	Female	Intern	10 MONTHS	450	451	452	455	456	455	456	457	450	451	452	455	456	456	457	458	450	451	440	430	440	432	440	420	30	30	30
49	1152160	84	130/82	100	16	24	Female	Intern	10 MONTHS	351	346	378	378	377	378	379	380	381	382	388	381	382	382	384	399	380	384	390	399	395	394	392	394	30	31	31
50	1156337	94	128/80	100	16	26	Female	JR-1 YEAR	1 YEAR	720	722	720	740	741	720	721	720	721	722	721	710	720	721	722	724	725	720	721	722	724	725	726	722	34	32	32
51	1157114	90	130/82	100	14	25	Male	JR-1 YEAR	1 YEAR	355	360	361	362	364	364	376	377	378	379	380	378	376	377	378	376	377	376	377	366	378	376	377	376	31	30	30
52	1157450	84	112/72	98	16	23	Female	Intern	10 MONTHS	590	591	592	594	588	587	586	587	588	587	584	585	586	584	585	586	584	585	586	584	584	585	590	589	32	33	33
53	660239	89	128/72	99	14	28	Male	JR-3 YEAR	2 YEARS	400	402	405	410	420	405	420	422	424	425	424	424	426	430	444	450	444	423	425	426	420	424	426	430	29	30	29
54	1158829	73	118/73	100	16	23	Female	Intern	10 MONTHS	694	694	693	692	692	691	693	689	689	687	688	689	687	687	688	682	680	681	682	682	682	682	681	681	27	27	27
55	1139649	82	120/62	100	18	24	Male	Intern	10 MONTHS	688	691	692	692	690	691	690	688	688	690	694	692	692	692	698	699	680	682	700	701	700	700	702	702	30	31	30
56	1162177	78	120/82	98	18	27	Female	JR-3 YEAR	2 YEARS	522	524	550	525	524	522	520	522	524	524	524	529	530	532	531	532	532	534	534	535	540	541	542	544	32	32	33
57	1161487	92	110/72	99	14	26	Female	JR-1YEAR	1 YEAR	548	544	545	546	488	486	487	488	489	500	501	502	501	500	501	502	503	504	505	506	510	510	511	512	31	30	31
58	623345	78	112/70	99	18	28	Female	JR-1 YEAR	1 YEAR	350	351	352	350	352	355	350	358	340	360	361	362	364	362	364	364	365	366	368	370	390	400	401	399	28	29	29
59	645900	84	130/90	99	16	25	Male	JR-1 YEAR	1 YEAR	520	522	522	524	525	526	527	528	525	540	520	499	500	510	511	517	513	514	515	516	518	518	520	521	32	32	32
60	1165209	80	130/70	98	16	24	Female	Intern	10 MONTHS	352	350	358	296	294	295	295	280	292	292	292	292	321	319	320	320	320	321	318	321	318	315	314	315	27	28	28
61	4494	72	120/72	99	16	23	Female	Intern	10 MONTHS	320	322	324	325	325	324	298	296	300	312	300	312	298	299	300	301	302	301	301	301	302	302	301	300	32	31	30
62	1151763	72	130/80	99	15	24	Female	Intern	10 MONTHS	550	540	541	542	550	516	520	521	522	523	524	525	524	526	520	521	522	523	540	545	540	541	542	542	30	31	31
63	1165524	78	130/80	99	18	23	Female	Intern	10 MONTHS	380	381	382	384	385	386	388	384	385	384	382	390	400	402	404	399	398	402	402	401	399	398	400	400	30	29	29
64	802035	78	128/80	99	18	23	Male	Intern	10 MONTHS	250	230	222	231	235	270	288	300	301	299	300	289	290	291	292	293	300	305	288	281	282	285	286	287	27	27	28
65	1167495	88	130/80	100	16	23	Male	Intern	10 MONTHS	380	382	380	380	368	370	366	378	380	381	388	399	400	398	398	397	396	397	398	366	370	377	380	381	30	29	29
66	223237	78	130/80	99	18	23	Male	Intern	10 MONTHS	300	305	310	311	302	302	304	305	300	299	300	302	302	300	302	304	302	302	304	310	312	310	299	300	28	27	27
67	612117	80	120/72	99	18	23	Female	Intern	10 MONTHS	355	340	290	299	300	302	310	322	323	324	325	330	340	341	350	355	360	356	340	350	351	345	340	341	29	28	28

S. No.	MRD No.	$EtCO_2$(4)	$EtCO_2$(5)	$EtCO_2$(6)	$EtCO_2$(7)	$EtCO_2$(8)	$EtCO_2$(9)	$EtCO_2$(10)	$EtCO_2$(11)	$EtCO_2$(12)	$EtCO_2$(13)	$EtCO_2$(14)	$EtCO_2$(15)	$EtCO_2$(16)	$EtCO_2$(17)	$EtCO_2$(18)	$EtCO_2$(19)	$EtCO_2$(20)	$EtCO_2$(21)	$EtCO_2$(22)	$EtCO_2$(23)	$EtCO_2$(24)	SpO_2(1)	SpO_2(2)	SpO_2(3)	SpO_2(4)	SpO_2(5)
1	1138248	28	29	30	30	30	31	31	30	30	31	30	29	29	29	30	30	30	30	30	31	30	100	100	100	100	100
2	1136879	31	32	31	30	32	32	32	30	31	32	31	30	31	31	31	31	30	30	31	30	31	100	100	100	100	100
3	1138912	33	32	33	32	32	32	32	32	32	30	32	32	32	32	32	32	32	30	32	32	32	100	100	100	100	100
4	1139582	30	31	30	30	30	30	29	30	30	30	30	31	30	30	30	31	30	31	30	30	30	100	100	100	100	100
5	1139536	28	28	28	28	28	29	29	29	29	29	29	29	28	29	29	29	29	29	29	29	29	100	100	100	100	100
6	1138845	29	29	29	29	28	27	28	28	28	28	29	28	28	27	27	26	27	27	27	27	28	100	100	100	100	100
7	1139621	31	30	30	31	30	30	30	30	31	30	31	31	30	31	30	31	31	30	30	30	30	100	100	100	100	100
8	1140209	30	31	30	31	30	31	30	31	31	30	30	30	30	30	31	30	31	31	32	31	30	100	100	100	100	100
9	520367	30	30	31	30	30	31	30	30	31	30	28	29	28	29	29	30	30	30	30	30	30	100	100	100	100	100
10	1140269	29	30	29	28	27	28	29	29	29	29	30	30	31	30	29	29	29	30	30	30	30	100	100	100	100	100
11	1140392	29	30	30	29	29	28	29	29	29	29	29	30	30	29	29	29	29	29	28	29	29	100	100	100	100	100
12	1140791	30	29	28	29	28	29	28	29	28	30	30	30	30	30	31	30	30	30	31	31	30	100	100	100	100	100
13	773061	29	30	30	29	29	29	29	29	30	31	30	30	30	30	30	30	30	30	30	29	29	100	100	100	100	100
14	214197	30	30	30	29	28	30	31	30	30	30	30	30	29	29	29	30	31	30	29	29	29	100	100	100	100	100
15	8224	30	30	31	30	29	29	30	30	30	29	29	30	30	30	29	29	30	31	30	30	30	100	100	100	100	100
16	1141081	27	26	24	23	24	25	26	26	26	26	26	27	26	27	27	27	27	28	27	26	27	100	100	100	100	100
17	37863	28	28	27	27	28	29	29	28	27	27	28	29	29	29	29	29	29	29	28	29	29	100	100	100	100	100
18	1141851	28	27	27	28	29	29	29	28	28	27	27	28	28	27	27	27	28	29	28	28	28	100	100	100	100	100
19	1142539	28	29	29	28	29	29	29	29	29	28	29	29	28	29	29	28	29	29	29	29	28	100	100	100	100	100
20	1142787	35	35	34	34	34	34	34	35	34	32	33	34	34	34	34	34	34	33	32	33	33	100	100	100	100	100
21	1142811	27	27	26	27	26	27	27	28	27	27	28	28	28	28	28	29	28	28	27	27	27	100	100	100	100	100
22	262995	29	29	29	29	28	29	29	29	30	30	30	30	29	29	29	28	29	29	29	30	30	100	100	100	100	100
23	1144187	28	28	28	27	27	27	28	28	28	28	28	29	28	28	28	28	28	27	28	27	27	100	100	100	100	100
24	1139900	33	33	32	32	32	32	32	33	33	33	32	32	32	32	32	31	32	32	32	32	32	100	100	100	100	100
25	1145778	31	30	31	30	31	30	30	31	30	30	31	30	31	30	30	31	30	31	30	31	31	100	100	100	100	100
26	848879	30	30	31	30	31	31	31	30	30	30	30	30	31	31	30	31	31	32	32	32	31	100	100	100	100	100
27	835205	33	34	33	33	32	32	32	33	32	32	32	33	32	33	33	33	32	33	33	32	33	100	100	100	100	100
28	1145656	32	33	32	32	32	33	33	33	32	33	33	33	33	33	32	33	33	32	32	33	33	100	100	100	100	100
29	540861	31	30	29	29	30	30	30	31	30	30	31	30	30	30	30	30	30	30	31	30	31	100	100	100	100	100
30	1146734	30	30	31	30	30	30	31	30	31	30	31	32	31	31	31	31	31	31	30	31	31	100	100	100	100	100
31	1147315	27	27	26	27	26	26	26	26	27	26	26	26	27	26	26	26	26	26	25	26	26	100	100	100	100	100
32	430418	29	29	30	31	31	32	32	32	31	31	32	32	32	32	31	32	32	31	32	32	32	100	100	100	100	100
33	1149039	24	25	26	26	27	26	27	27	27	28	29	29	28	28	28	29	29	28	28	28	29	100	100	100	100	100
34	1013290	32	32	32	32	31	30	30	30	31	30	30	30	31	30	30	31	30	30	31	31	32	100	100	100	100	100
35	1147672	32	33	32	33	33	33	34	33	34	33	34	34	33	33	33	34	34	33	33	33	34	100	100	100	100	100
36	1148157	18	25	25	26	27	28	29	26	27	27	27	28	27	28	28	29	28	28	29	29	30	100	100	100	100	100
37	1149991	32	33	33	34	34	34	33	32	33	34	33	33	33	34	33	32	33	33	33	32	33	100	100	100	100	100
38	1150571	25	25	24	24	25	26	24	24	24	25	24	24	24	25	26	24	24	24	25	25	24	100	100	100	100	100
39	1152655	31	31	31	30	31	30	31	31	30	31	31	31	32	31	31	30	31	30	31	31	31	100	100	100	100	100
40	1152426	28	28	29	28	28	28	28	27	27	28	29	29	28	27	28	27	26	27	28	27	27	100	100	100	100	100
41	120948	32	32	30	32	32	32	32	30	32	33	33	32	33	32	33	32	33	33	32	33	32	100	100	100	100	100
42	552451	31	30	30	30	30	31	30	31	30	30	30	31	31	31	32	32	31	32	32	32	32	100	100	100	100	100
43	1149328	30	31	30	29	29	30	31	29	29	29	30	31	30	30	30	30	30	29	29	29	30	100	100	100	100	100
44	1120549	31	30	31	30	30	31	30	31	30	31	30	30	31	30	30	31	31	30	30	30	30	100	100	100	100	100
45	218363	33	34	33	33	33	33	34	34	33	34	34	33	34	33	34	34	33	34	34	34	33	100	100	100	100	100
46	1156277	28	29	29	28	27	26	26	26	26	26	27	27	27	28	28	28	28	29	28	28	28	100	100	100	100	100
47	1157635	31	30	30	29	29	30	31	31	30	31	31	31	30	31	30	30	31	32	31	31	31	100	100	100	100	100
48	1155186	31	30	30	31	31	30	30	31	30	31	30	30	31	30	30	31	30	30	30	31	30	100	100	100	100	100
49	1152160	30	31	31	30	31	31	31	30	31	30	31	30	30	31	30	31	30	30	31	31	30	100	100	100	100	100
50	1156337	32	33	34	34	34	34	34	33	32	33	32	33	32	33	32	32	32	33	34	32	33	100	100	100	100	100
51	1157114	31	30	31	30	31	29	30	30	29	29	30	30	30	30	30	30	29	29	30	30	30	100	100	100	100	100
52	1157450	33	34	33	33	33	33	33	34	34	34	34	33	32	32	33	32	33	34	33	33	34	100	100	100	100	100
53	660239	29	30	30	29	29	29	30	29	29	29	30	30	30	31	30	30	30	30	30	30	31	100	100	100	100	100
54	1158829	27	26	26	26	26	26	26	26	26	28	28	28	28	29	29	29	28	28	28	28	29	100	100	100	100	100
55	1139649	30	30	31	30	30	30	30	31	30	30	30	30	31	30	31	31	31	31	31	30	31	100	100	100	100	100
56	1162177	32	32	32	32	32	33	32	32	33	32	32	32	32	32	32	32	31	31	30	31	31	100	100	100	100	100
57	1161487	30	30	30	31	30	31	30	30	30	31	30	30	31	30	31	30	31	30	30	30	30	100	100	100	100	100
58	623345	29	29	30	30	30	29	29	28	28	28	28	29	30	30	29	29	30	31	30	30	30	100	100	100	100	100
59	645900	32	32	31	31	32	32	31	31	30	31	30	31	31	30	31	30	31	31	30	31	30	100	100	100	100	100
60	1165209	28	28	29	27	28	28	28	27	27	27	26	27	27	27	27	26	27	28	28	28	28	100	100	100	100	100
61	4494	30	31	30	30	30	30	30	31	30	29	29	28	29	30	29	29	29	29	30	31	30	100	100	100	100	100
62	1151763	31	31	31	31	32	32	31	31	32	32	32	31	32	32	31	31	32	32	32	32	31	100	100	100	100	100
63	1165524	28	29	29	28	28	29	29	29	28	29	29	30	30	30	29	29	29	29	30	30	30	100	100	100	100	100
64	802035	27	26	27	27	27	27	26	27	26	27	26	27	26	26	27	27	27	26	27	27	26	100	100	100	100	100
65	1167495	28	29	30	30	29	29	29	28	29	29	29	28	28	28	28	28	27	28	27	28	28	100	100	100	100	100
66	223237	28	27	27	28	29	30	29	28	28	29	29	29	29	30	30	30	30	29	29	29	29	100	100	100	100	100
67	612117	28	29	29	28	28	27	27	26	27	26	27	28	28	28	28	29	28	30	29	29	29	100	100	100	100	100

S. No.	MRD No.	SpO_2(6)	SpO_2(7)	SpO_2(8)	SpO_2(9)	SpO_2(10)	SpO_2(11)	SpO_2(12)	SpO_2(13)	SpO_2(11)	SpO_2(12)	SpO_2(13)	SpO_2(14)	SpO_2(15)	SpO_2(16)	SpO_2(17)	SpO_2(18)	SpO_2(19)	SpO_2(20)	SpO_2(21)	SpO_2(22)	SpO_2(23)	SpO_2(24)	Failed breath (yes/no)	Total number of failed breaths	Failed breath (FB) 1	FB2	FB3	FB4	FB5
1	1138248	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
2	1136879	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
3	1138912	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
4	1139582	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
5	1139536	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
6	1138845	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
7	1139621	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
8	1140209	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
9	520367	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
10	1140269	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
11	1140392	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
12	1140791	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
13	773061	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
14	214197	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
15	8224	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
16	1141081	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	yes	2	1	1	0	0	0
17	37863	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
18	1141851	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
19	1142539	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
20	1142787	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
21	1142811	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
22	262995	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
23	1144187	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
24	1139900	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
25	1145778	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
26	848879	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
27	835205	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
28	1145656	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
29	540861	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
30	1146734	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
31	1147315	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
32	430418	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
33	1149039	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	yes	2	1	1	0	0	0
34	1013290	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
35	1147672	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
36	1148157	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	yes	2	0	0	1	1	0
37	1149991	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
38	1150571	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
39	1152655	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
40	1152426	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
41	120948	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
42	552451	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
43	1149328	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
44	1120549	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
45	218363	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
46	1156277	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
47	1157635	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
48	1155186	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
49	1152160	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
50	1156337	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
51	1157114	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
52	1157450	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
53	660239	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
54	1158829	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
55	1139649	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
56	1162177	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
57	1161487	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
58	623345	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
59	645900	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
60	1165209	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
61	4494	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
62	1151763	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
63	1165524	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
64	802035	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
65	1167495	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
66	223237	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
67	612117	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0

S. No.	MRD No.	FB6	FB7	FB8	FB9	FB10	FB11	FB12	FB13	FB14	FB15	FB16	FB17	FB18	FB19	FB20	FB21	FB22	FB23	FB24	HR 1	HR 2	HR 3	HR 4	HR 5	HR 6	HR 7	HR 8	HR 9	HR 10	HR 11	HR 12	HR 13	HR 14	HR 15	HR 16	HR 17	HR 18	HR 19	HR 20	HR 21	HR 22	HR 23	HR 24
1	1138248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	76	76	77	76	72	73	74	76	76	76	77	76	76	75	76	76	76	74	74	75	76	76	74	74
2	1136879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	78	76	77	76	76	74	74	72	72	70	71	72	72	70	71	72	72	71	71	70	71	70	70
3	1138912	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	90	91	89	89	90	91	90	91	89	88	87	88	89	89	89	90	89	89	89	89	88	89	89
4	1139582	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	62	61	62	62	63	64	63	62	62	61	62	62	62	63	62	62	62	66	64	64	65	64	64
5	1139536	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	84	82	82	82	80	78	78	78	76	76	76	76	76	76	74	76	76	76	75	76	76	77	76
6	1138845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	69	69	68	68	68	69	70	71	70	70	70	70	69	69	68	69	70	70	69	69	69	69	68
7	1139621	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	70	68	69	69	68	68	68	69	70	70	71	70	69	68	68	70	71	72	70	71	72	71	70
8	1140209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	90	92	90	91	92	90	88	86	88	89	90	90	89	89	89	88	89	86	88	86	84	86	86
9	520367	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	91	90	91	90	91	90	90	90	89	90	91	92	90	91	91	90	91	92	92	91	90	91	91
10	1140269	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	84	84	82	82	82	80	82	82	82	82	82	82	80	80	82	80	82	82	80	80	81	80
11	1140392	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	71	72	73	70	71	71	70	72	74	74	76	74	74	72	74	74	72	73	74	74	72	72	70
12	1140791	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	71	70	72	72	73	72	72	70	68	69	70	71	70	70	69	68	69	70	70	71	70	71	70
13	773061	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	70	72	74	78	80	82	82	80	82	84	84	84	84	86	86	84	84	85	86	84	84	84	85
14	214197	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	80	82	80	82	80	81	80	81	80	80	80	80	81	80	80	79	80	78	79	78	80	80
15	8224	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	70	78	81	82	81	80	81	80	80	78	80	81	80	78	78	80	81	80	81	80	81	80	80
16	1141081	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	63	64	62	64	65	66	64	63	64	65	64	63	64	65	64	64	65	65	66	65	65	65	64
17	37863	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	89	88	84	82	80	78	79	80	79	78	78	79	79	78	78	78	79	79	79	78	78	79	78
18	1141851	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	82	78	78	78	78	74	74	76	76	77	78	77	76	76	77	76	72	73	74	73	74	74
19	1142539	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	84	83	82	82	82	82	82	84	82	82	80	80	80	81	80	81	80	81	80	82	82	84	84
20	1142787	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	68	70	69	69	69	68	68	69	70	71	70	69	69	68	69	69	68	69	69	68	68	69	68
21	1142811	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	82	82	83	84	83	83	82	82	83	83	84	83	83	84	82	83	83	84	82	83	83	82	82
22	262995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	74	72	70	70	72	72	70	70	70	70	68	66	66	68	68	69	69	70	69	69	70	69	69
23	1144187	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	89	90	91	92	90	90	89	88	89	90	90	88	89	88	89	90	89	89	88	89	90	89	89
24	1139900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	86	86	88	88	88	86	84	84	82	83	84	84	83	82	82	80	81	82	83	83	82	82	81
25	1145778	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	76	76	74	76	74	75	76	76	78	78	79	78	78	76	74	73	74	74	75	75	76	76	76
26	848879	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	80	82	84	82	80	82	86	84	82	82	78	79	80	79	79	78	79	79	80	81	80	80
27	835205	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	78	77	76	77	78	79	79	80	82	82	80	81	80	81	82	81	80	81	80	80	81	80
28	1145656	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	82	80	82	84	82	84	84	86	88	89	88	86	86	88	87	88	86	84	86	85	85	
29	540861	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	64	66	68	68	68	65	66	66	67	66	65	66	67	66	68	67	66	65	66	67	66	68	66
30	1146734	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	72	70	72	70	72	72	70	71	70	71	72	72	72	71	70	70	71	70	71	70	71	70	70
31	1147315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	74	73	72	72	68	67	66	68	67	68	68	70	70	68	68	69	70	71	70	68	67	66	66
32	430418	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	74	72	74	72	74	72	72	74	73	73	72	71	70	72	71	70	69	69	70	70	69	68	69
33	1149039	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	73	74	72	72	73	74	75	76	77	78	78	78	79	79	78	79	78	77	77	76	77	78
34	1013290	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	82	80	78	76	77	78	77	76	77	78	77	80	82	80	81	82	80	78	77	78	79	80	81
35	1147672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	68	66	68	66	65	66	65	66	67	68	69	68	67	66	66	67	67	67	66	68	67	67	66
36	1148157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	84	82	82	82	80	81	80	81	80	82	81	82	81	80	81	82	82	81	81	80	81	82	82
37	1149991	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	77	76	77	78	77	76	77	78	79	80	81	78	79	79	80	79	78	78	77	78	79	79	78
38	1150571	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	61	60	62	62	62	62	63	62	62	62	63	62	61	62	62	62	61	62	62	62	61	62	61
39	1152655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	91	90	89	89	90	91	90	90	91	92	90	91	91	92	90	91	90	91	92	92	92	91	91
40	1152426	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	70	72	70	70	71	70	71	70	71	70	72	71	70	71	70	72	70	71	70	71	70	71	71
41	120948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	70	70	70	71	70	70	72	70	71	70	71	70	70	71	70	68	67	66	67	68	68	67	68
42	552451	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	70	70	71	72	70	70	71	70	71	71	70	71	70	70	71	70	70	70	71	70	70	70	70
43	1149328	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	77	76	77	76	78	76	77	78	80	81	80	78	76	78	78	77	76	78	79	80	81	80	80
44	1120549	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	70	68	67	66	68	68	68	67	68	67	68	69	68	69	69	69	68	67	68	68	67	68	69
45	218363	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	66	65	64	65	66	65	66	64	65	66	64	65	66	65	66	67	66	64	64	65	66	67	67
46	1156277	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	70	69	68	69	70	71	72	73	74	72	72	70	70	71	70	72	70	71	71	72	71	71	72
47	1157635	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	78	77	76	78	78	76	77	76	77	76	77	76	76	77	76	77	78	80	80	81	78	77	78
48	1155186	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	76	77	80	81	82	83	84	85	84	83	82	82	83	84	84	83	83	82	82	83	82	83	83
49	1152160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	84	86	84	84	86	84	82	80	80	81	80	81	80	80	81	80	80	81	80	80	81	80
50	1156337	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	89	88	87	88	89	90	90	89	88	89	88	89	89	89	90	89	88	89	88	90	91	90	89
51	1157114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94	92	92	91	90	91	90	91	90	91	92	93	92	92	92	91	92	91	90	91	91	92	92	92
52	1157450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	84	84	83	82	83	84	84	83	83	84	85	84	83	84	83	82	83	82	83	84	83	83
53	660239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	80	81	82	82	84	83	84	84	82	80	81	82	84	83	83	84	84	83	82	82	80	82
54	1158829	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	70	70	69	68	68	68	68	66	66	65	66	66	65	66	66	66	67	67	67	67	66	66	
55	1139649	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	83	84	82	82	80	81	80	81	80	81	80	81	80	81	82	80	81	80	81	80	81	82	82
56	1162177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	72	74	74	74	72	72	70	70	71	70	72	72	72	74	72	73	72	74	74	72	73	74
57	1161487	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	89	90	91	90	90	90	89	89	88	88	89	89	88	89	89	90	90	91	90	89	89	88	89
58	623345	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	70	68	69	70	71	72	74	73	72	73	74	74	74	72	72	72	70	72	74	72	72	70	70
59	645900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	68	69	68	68	69	70	72	70	71	70	71	69	68	69	69	68	69	70	70	71	70	70
60	1165209	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	78	78	78	78	76	76	77	78	76	76	74	76	76	74	75	76	76	76	77	78	76	76
61	4494	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	74	75	76	77	78	79	79	79	78	76	76	77	76	77	78	79	79	79	78	77	76	76	77
62	1151763	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	72	73	74	74	73	72	73	73	74	72	73	72	72	73	74	73	72	72	73	72	72	72	72
63	1165524	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	78	78	76	77	78	80	80	81	80	79	79	78	79	79	79	78	79	79	79	78	78	79	79
64	802035	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	78	76	78	72	76	76	77	78	78	78	79	80	79	78	77	76	77	78	79	78	78	76
65	1167495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	78	76	77	76	77	76	77	78	77	76	76	77	76	78	80	81	80	81	86	86	78	80	81
66	223237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	82	80	78	78	78	80	81	82	80	81	80	81	79	78	79	80	81	80	80	79	79	79
67	612117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	84	82	82	82	80	81	82	80	80	78	76	77	78	76	77	78	79	80	81	80	78	79

S. No.	MRD No.	NIBP 1	NIBP 2	NIBP 3	NIBP 4	NIBP 5	NIBP 6	NIBP 7	NIBP 8	NIBP 9	NIBP 10	NIBP 11	NIBP 12	NIBP 13	NIBP 14	NIBP 15	NIBP 16	NIBP 17	NIBP 18	NIBP 19	NIBP 20	NIBP 21	NIBP 22	NIBP 23	NIBP 24	ECG RHYTHM 1	ECG RHYTHM 2	ECG RHYTHM 3	ECG RHYTHM 4	ECG RHYTHM 5	ECG RHYTHM 6
1	1138248	130/81	130/81	130/81	130/81	130/81	130/81	130/81	130/81	130/81	130/81	130/81	130/81	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	NSR	NSR	NSR	NSR	NSR	NSR
2	1136879	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	NSR	NSR	NSR	NSR	NSR	NSR
3	1138912	138/90	138/90	138/90	138/90	138/90	138/90	138/90	138/90	138/90	138/90	138/90	138/90	138/89	138/89	138/89	138/89	138/89	138/89	138/89	138/89	138/89	138/89	138/89	138/89	NSR	NSR	NSR	NSR	NSR	NSR
4	1139582	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	NSR	NSR	NSR	NSR	NSR	NSR
5	1139536	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	120/78	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	NSR	NSR	NSR	NSR	NSR	NSR
6	1138845	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	108/62	108/62	108/62	108/62	108/62	108/62	108/62	108/62	108/62	108/62	108/62	108/62	NSR	NSR	NSR	NSR	NSR	NSR
7	1139621	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	NSR	NSR	NSR	NSR	NSR	NSR
8	1140209	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	110/64	110/64	110/64	110/64	110/64	110/64	110/64	110/64	110/64	110/64	110/64	110/64	NSR	NSR	NSR	NSR	NSR	NSR
9	520367	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	120/82	NSR	NSR	NSR	NSR	NSR	NSR
10	1140269	138/70	138/70	138/70	138/70	138/70	138/70	138/70	138/70	138/70	138/70	138/70	138/70	130/69	130/69	130/69	130/69	130/69	130/69	130/69	130/69	130/69	130/69	130/69	130/69	NSR	NSR	NSR	NSR	NSR	NSR
11	1140392	130/70	130/70	130/70	130/70	130/70	130/70	130/70	130/70	130/70	130/70	130/70	130/70	128/68	128/68	128/68	128/68	128/68	128/68	128/68	128/68	128/68	128/68	128/68	128/68	NSR	NSR	NSR	NSR	NSR	NSR
12	1140791	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	NSR	NSR	NSR	NSR	NSR	NSR
13	773061	122/80	122/80	122/80	122/80	122/80	122/80	122/80	122/80	122/80	122/80	122/80	122/80	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	NSR	NSR	NSR	NSR	NSR	NSR
14	214197	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	NSR	NSR	NSR	NSR	NSR	NSR
15	8224	100/78	100/78	100/78	100/78	100/78	100/78	100/78	100/78	100/78	100/78	100/78	100/78	106/72	106/72	106/72	106/72	106/72	106/72	106/72	106/72	106/72	106/72	106/72	106/72	NSR	NSR	NSR	NSR	NSR	NSR
16	1141081	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	NSR	NSR	NSR	NSR	NSR	NSR
17	37863	138/82	138/82	138/82	138/82	138/82	138/82	138/82	138/82	138/82	138/82	138/82	138/82	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	NSR	NSR	NSR	NSR	NSR	NSR
18	1141851	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	NSR	NSR	NSR	NSR	NSR	NSR
19	1142539	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	NSR	NSR	NSR	NSR	NSR	NSR
20	1142787	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	104/63	104/63	104/63	104/63	104/63	104/63	104/63	104/63	104/63	104/63	104/63	104/63	NSR	NSR	NSR	NSR	NSR	NSR
21	1142811	107/64	107/64	107/64	107/64	107/64	107/64	107/64	107/64	107/64	107/64	107/64	107/64	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	NSR	NSR	NSR	NSR	NSR	NSR
22	262995	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	NSR	NSR	NSR	NSR	NSR	NSR
23	1144187	112/73	112/73	112/73	112/73	112/73	112/73	112/73	112/73	112/73	112/73	112/73	112/73	107/70	107/70	107/70	107/70	107/70	107/70	107/70	107/70	107/70	107/70	107/70	107/70	NSR	NSR	NSR	NSR	NSR	NSR
24	1139900	132/82	132/82	132/82	132/82	132/82	132/82	132/82	132/82	132/82	132/82	132/82	132/82	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	NSR	NSR	NSR	NSR	NSR	NSR
25	1145778	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	117/72	117/72	117/72	117/72	117/72	117/72	117/72	117/72	117/72	117/72	117/72	117/72	NSR	NSR	NSR	NSR	NSR	NSR
26	848879	123/78	123/78	123/78	123/78	123/78	123/78	123/78	123/78	123/78	123/78	123/78	123/78	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	NSR	NSR	NSR	NSR	NSR	NSR
27	835205	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	NSR	NSR	NSR	NSR	NSR	NSR
28	1145656	102/70	102/70	102/70	102/70	102/70	102/70	102/70	102/70	102/70	102/70	102/70	102/70	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	100/68	NSR	NSR	NSR	NSR	NSR	NSR
29	540861	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	NSR	NSR	NSR	NSR	NSR	NSR
30	1146734	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	116/76	NSR	NSR	NSR	NSR	NSR	NSR
31	1147315	124/80	124/80	124/80	124/80	124/80	124/80	124/80	124/80	124/80	124/80	124/80	124/80	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	NSR	NSR	NSR	NSR	NSR	NSR
32	430418	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	118/78	115/72	115/72	115/72	115/72	115/72	115/72	115/72	115/72	115/72	115/72	115/72	115/72	NSR	NSR	NSR	NSR	NSR	NSR
33	1149039	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/67	110/67	110/67	110/67	110/67	110/67	110/67	110/67	110/67	110/67	110/67	110/67	NSR	NSR	NSR	NSR	NSR	NSR
34	1013290	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	130/82	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	NSR	NSR	NSR	NSR	NSR	NSR
35	1147672	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	NSR	NSR	NSR	NSR	NSR	NSR
36	1148157	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	121/72	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	NSR	NSR	NSR	NSR	NSR	NSR
37	1149991	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	NSR	NSR	NSR	NSR	NSR	NSR
38	1150571	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	104/70	104/70	104/70	104/70	104/70	104/70	104/70	104/70	104/70	104/70	104/70	104/70	NSR	NSR	NSR	NSR	NSR	NSR
39	1152655	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	NSR	NSR	NSR	NSR	NSR	NSR
40	1152426	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	NSR	NSR	NSR	NSR	NSR	NSR
41	120948	100/62	100/62	100/62	100/62	100/62	100/62	100/62	100/62	100/62	100/62	100/62	100/62	104/64	104/64	104/64	104/64	104/64	104/64	104/64	104/64	104/64	104/64	104/64	104/64	NSR	NSR	NSR	NSR	NSR	NSR
42	552451	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	NSR	NSR	NSR	NSR	NSR	NSR
43	1149328	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	NSR	NSR	NSR	NSR	NSR	NSR
44	1120549	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	NSR	NSR	NSR	NSR	NSR	NSR
45	218363	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	132/78	137/78	137/78	137/78	137/78	137/78	137/78	137/78	137/78	137/78	137/78	137/78	137/78	NSR	NSR	NSR	NSR	NSR	NSR
46	1156277	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	NSR	NSR	NSR	NSR	NSR	NSR
47	1157635	136/76	136/76	136/76	136/76	136/76	136/76	136/76	136/76	136/76	136/76	136/76	136/76	128/77	128/77	128/77	128/77	128/77	128/77	128/77	128/77	128/77	128/77	128/77	128/77	NSR	NSR	NSR	NSR	NSR	NSR
48	1155186	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	NSR	NSR	NSR	NSR	NSR	NSR
49	1152160	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	NSR	NSR	NSR	NSR	NSR	NSR
50	1156337	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	NSR	NSR	NSR	NSR	NSR	NSR
51	1157114	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	NSR	NSR	NSR	NSR	NSR	NSR
52	1157450	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	NSR	NSR	NSR	NSR	NSR	NSR
53	660239	124/62	124/62	124/62	124/62	124/62	124/62	124/62	124/62	124/62	124/62	124/62	124/62	118/60	118/60	118/60	118/60	118/60	118/60	118/60	118/60	118/60	118/60	118/60	118/60	NSR	NSR	NSR	NSR	NSR	NSR
54	1158829	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	110/62	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	NSR	NSR	NSR	NSR	NSR	NSR
55	1139649	112/78	112/78	112/78	112/78	112/78	112/78	112/78	112/78	112/78	112/78	112/78	112/78	110/76	110/76	110/76	110/76	110/76	110/76	110/76	110/76	110/76	110/76	110/76	110/76	NSR	NSR	NSR	NSR	NSR	NSR
56	1162177	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	NSR	NSR	NSR	NSR	NSR	NSR
57	1161487	138/84	138/84	138/84	138/84	138/84	138/84	138/84	138/84	138/84	138/84	138/84	138/84	128/80	128/80	128/80	128/80	128/80	128/80	128/80	128/80	128/80	128/80	128/80	128/80	NSR	NSR	NSR	NSR	NSR	NSR
58	623345	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	100/70	NSR	NSR	NSR	NSR	NSR	NSR
59	645900	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	NSR	NSR	NSR	NSR	NSR	NSR
60	1165209	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	NSR	NSR	NSR	NSR	NSR	NSR
61	4494	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	NSR	NSR	NSR	NSR	NSR	NSR
62	1151763	127/72	127/72	127/72	127/72	127/72	127/72	127/72	127/72	127/72	127/72	127/72	127/72	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	NSR	NSR	NSR	NSR	NSR	NSR
63	1165524	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	130/80	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	124/78	NSR	NSR	NSR	NSR	NSR	NSR
64	802035	128/70	128/70	128/70	128/70	128/70	128/70	128/70	128/70	128/70	128/70	128/70	128/70	117/68	117/68	117/68	117/68	117/68	117/68	117/68	117/68	117/68	117/68	117/68	117/68	NSR	NSR	NSR	NSR	NSR	NSR
65	1167495	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	NSR	NSR	NSR	NSR	NSR	NSR
66	223237	128/88	128/88	128/88	128/88	128/88	128/88	128/88	128/88	128/88	128/88	128/88	128/88	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	NSR	NSR	NSR	NSR	NSR	NSR
67	612117	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	120/78	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	NSR	NSR	NSR	NSR	NSR	NSR

S. No.	MRD No.	ECG RHYTHM 7	ECG RHYTHM 8	ECG RHYTHM 9	ECG RHYTHM 10	ECG RHYTHM 11	ECG RHYTHM 12	ECG RHYTHM 13	ECG RHYTHM 14	ECG RHYTHM 15	ECG RHYTHM 16	ECG RHYTHM 17	ECG RHYTHM 18	ECG RHYTHM 19	ECG RHYTHM 20	ECG RHYTHM 21	ECG RHYTHM 22	ECG RHYTHM 23	ECG RHYTHM 24	RESCUE METHOD USED	Airway provider 5 -point likert scale(comfortability level)
1	1138248	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
2	1136879	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
3	1138912	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
4	1139582	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
5	1139536	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
6	1138845	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
7	1139621	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
8	1140209	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
9	520367	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
10	1140269	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
11	1140392	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
12	1140791	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
13	773061	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
14	214197	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
15	8224	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
16	1141081	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
17	37863	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
18	1141851	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
19	1142539	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
20	1142787	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
21	1142811	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
22	262995	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
23	1144187	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
24	1139900	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
25	1145778	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
26	848879	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
27	835205	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
28	1145656	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
29	540861	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
30	1146734	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
31	1147315	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
32	430418	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
33	1149039	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	UN-COMFORTABLE
34	1013290	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
35	1147672	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
36	1148157	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
37	1149991	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
38	1150571	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
39	1152655	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
40	1152426	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
41	120948	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
42	552451	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
43	1149328	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
44	1120549	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
45	218363	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
46	1156277	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
47	1157635	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
48	1155186	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
49	1152160	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
50	1156337	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
51	1157114	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
52	1157450	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
53	660239	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
54	1158829	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
55	1139649	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
56	1162177	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
57	1161487	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
58	623345	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
59	645900	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
60	1165209	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
61	4494	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
62	1151763	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
63	1165524	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
64	802035	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
65	1167495	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
66	223237	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
67	612117	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE

S. No.	MRD No.	Group	Age of the patient	Gender	Height (Cm)	Weight (Kg)	BMI (Kg/M²)	ASA physical status	Comorbidity	H/o Difficult BMV	H/o Snoring (yes/no)	H/o Neck radiation (yes/no)	H/o Ankylosing spondylitis (yes/no)	Dentition	Bearded	Nasal patency test	Mouth opening (Cm)	Thyromental distance (<6cm)	Neck movement (80-90deg/<80 deg)	Neck circumference >40/42 cm(F/M)	TMJ mobility (adequate / restricted)	ULBT	MMPS	Abnormal face, neck, airway anatomy
			Patient's demographics																					
68	1130031	A	45	f	160	53	20.7	2	HYPOTHYROID	NO	NO	NO	NO	1 missing teeth	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
69	846160	B	42	F	165	70	25.73	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
70	1167868	A	52	F	162	65	24.8	1	NO	NO	NO	NO	NO	2 Misssing teeth	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
71	1168918	B	55	F	162	56	21.37	1	NO	NO	NO	NO	NO	1 missing teeth	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
72	1171068	B	52	F	152	60	25.97	1	NO	NO	NO	NO	NO	2 Misssing teeth	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
73	1171945	B	19	M	180	59	18.2	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	1	NO
74	1175068	B	23	F	162	60	22.9	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
75	1174575	A	19	F	170	68	23.52	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
76	1168169	A	48	M	170	54	18.6	2	NO	NO	NO	NO	NO	2Missing teeth	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	1	NO
77	1177046	B	45	F	160	60	23.43	2	NO	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
78	1177636	B	50	F	160	53	20.7	2	NO	NO	NO	NO	NO	1 missing teeth	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
79	1176164	B	33	F	160	65	25.39	2	DIABETIC	NO	NO	NO	NO	Full	NO	patent	4.5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
80	1180888	A	45	F	157	60	24.34	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
81	1180422	B	34	F	160	60	23.43	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
82	1181397	A	42	M	152	60	25.97	2	HYPERTENSION	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
83	1183046	A	21	M	170	70	24.22	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
84	1175742	A	21	M	170	68	23.52	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
85	1028275	A	18	F	160	55	21.48	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
86	1181402	B	29	M	165	62	22.79	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
87	1177603	B	40	F	160	60	23.43	2	HYPERTENSION	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
88	1002352	A	20	M	175	78	25.49	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
89	1180428	A	25	F	162	48	18.32	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	1	NO
90	1156148	B	27	F	160	50	19.53	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
91	1186168	A	40	F	154	61	25.73	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
92	1166778	A	38	F	162	67	25.57	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
93	1186448	A	49	F	164	64	24.42	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
94	1115367	B	36	F	164	60	22.9	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	1	NO
95	691816	B	35	F	162	60	22.9	1	NO	NO	NO	NO	NO	Full	NO	patent	4.9	NO	80-90 DEGREE	NO	Adequate	1	2	NO
96	1184918	B	33	F	154	48	20.25	2	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
97	1194707	A	39	F	162	55	20.99	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
98	1182276	A	43	F	162	65	24.8	2	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
99	1194602	B	19	F	162	52	19.84	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
100	742376	A	30	F	162	64	24.42	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	1	NO
101	1191705	A	40	F	164	67	25	2	DIABETIC	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
102	1197232	B	39	F	165	60	22.05	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
103	1154941	A	41	M	172	63	21.35	1	NO	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
104	1093459	B	36	F	157	60	24.39	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
105	1192931	A	34	M	172	63	21.35	1	NO	NO	NO	NO	NO	Full	NO	patent	4.9	NO	80-90 DEGREE	NO	Adequate	1	1	NO
106	1198166	B	22	F	154	47	19.83	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	1	NO
107	438915	B	33	F	162	60	22.9	2	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
108	1043493	B	30	F	157	60	24.39	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
109	1163201	B	34	F	162	62	23.66	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
110	538485	A	38	F	157	52	21.13	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
111	587337	A	49	F	162	68	25.95	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
112	1205017	B	19	F	160	48	18.75	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
113	203214	A	49	F	162	65	24.8	2	HYPERTENSION	NO	NO	NO	NO	1 missing teeth	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	1	NO
114	1207548	B	40	F	164	65	24.25	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
115	1180675	A	42	F	162	56	21.3	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
116	1211089	A	32	F	162	68	25.95	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	1	NO
117	1213442	A	29	F	167	55	19.78	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
118	1213827	B	25	F	162	49	18.7	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
119	1213392	B	28	F	162	68	25.95	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
120	1215814	A	39	F	160	52	20.31	2	HYPOTHYROID	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
121	1169485	B	28	F	160	52	20.31	1	NO	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
122	1213870	A	26	M	167	69	24.82	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
123	1218932	A	40	M	180	76	23.45	1	NO	NO	NO	NO	NO	Full	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	2	NO
124	1218983	A	42	F	161	54	20.84	1	NO	NO	NO	NO	NO	1 missing teeth	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
125	1219150	A	39	F	162	53	20.22	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
126	1220663	B	46	F	160	60	23.43	2	DIABETIC	NO	NO	NO	NO	Full	NO	patent	4.8	NO	80-90 DEGREE	NO	Adequate	1	2	NO
127	1118908	B	27	M	177	80	25.55	2	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
128	697050	A	50	F	152	53	22.64	1	NO	NO	NO	NO	NO	2 Misssing teeth	NO	patent	5.2	NO	80-90 DEGREE	NO	Adequate	1	1	NO
129	1208608	A	46	F	150	55	24.4	1	NO	NO	NO	NO	NO	1 missing teeth	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
130	1203430	A	22	M	172	71	24.06	1	NO	NO	NO	NO	NO	Full	NO	patent	5	NO	80-90 DEGREE	NO	Adequate	1	2	NO
131	1222681	A	48	M	184	84	24.85	1	NO	NO	NO	NO	NO	Full	NO	patent	5.1	NO	80-90 DEGREE	NO	Adequate	1	2	NO
132	979831	B	28	M	172	70	24.06	1	NO	NO	NO	NO	NO	Full	NO	patent	5.3	NO	80-90 DEGREE	NO	Adequate	1	2	NO

S. No.	MRD No.	Base line vital parameters of patients				Age of airway provider (years)	Gender	Speciality and level of training of airway provider	Experience of airway provider in BMV	TV1	TV2	TV3	TV4	TV5	TV6	TV7	TV8	TV9	TV10	TV11	TV12	TV13	TV14	TV15	TV16	TV17	TV18	TV19	TV20	TV21	TV22	TV23	TV24	$EtCO_2(1)$	$EtCO_2(2)$	$EtCO_2(3)$
		Heart rate/min	NIBP(mm hg)	SpO_2%	RR/min																															
68	1130031	80	130/82	99	16	24	Male	Intern	10 MONTHS	300	301	299	225	220	221	240	250	300	301	302	301	301	300	299	288	299	300	301	301	302	310	311	311	29	28	27
69	846160	76	110/78	98	16	24	Male	Intern	10 MONTHS	450	450	452	455	460	470	478	477	478	450	466	478	490	499	480	481	488	482	482	484	483	485	490	499	31	30	30
70	1167868	80	130/80	98	16	38	Female	JR-1 YEAR	1 YEAR	322	320	322	323	324	325	333	334	340	320	321	322	323	324	322	340	342	340	341	342	350	322	320	321	29	28	29
71	1168918	80	128/78	98	18	24	Female	Intern	10 MONTHS	550	560	561	562	562	564	565	566	567	568	567	568	566	567	568	569	560	561	562	563	564	555	560	561	32	33	32
72	1171068	88	120/70	98	16	23	Male	Intern	10 MONTHS	458	459	458	444	450	451	452	453	455	480	489	489	486	476	450	460	470	488	490	476	476	477	488	480	31	32	33
73	1171945	72	110/80	99	18	24	Male	Intern	10 MONTHS	520	522	524	525	526	527	528	550	551	552	553	554	552	542	546	546	545	546	520	521	525	526	527	528	32	33	32
74	1175068	78	110/80	99	18	23	Female	Intern	10 MONTHS	550	552	551	545	546	547	548	549	530	535	534	532	530	531	532	555	541	530	522	522	523	524	526	524	30	31	32
75	1174575	70	120/68	100	18	23	Female	Intern	10 MONTHS	350	352	354	355	356	360	368	369	360	361	362	362	364	365	364	380	391	381	382	384	385	386	387	388	29	29	29
76	1168169	90	130/82	99	16	23	Female	Intern	10 MONTHS	400	402	403	404	410	402	420	421	415	416	440	440	430	432	433	434	435	440	450	451	452	453	450	451	28	29	29
77	1177046	82	120/82	100	15	24	Male	Intern	10 MONTHS	552	522	525	526	526	527	528	530	531	526	528	530	531	528	530	531	528	526	521	520	521	522	520	521	33	32	33
78	1177636	72	130/82	98	15	22	Male	Intern	10 MONTHS	520	522	523	540	545	546	547	548	550	525	526	527	533	540	545	546	555	560	545	538	540	541	545	548	34	34	33
79	1176164	80	110/70	98	18	23	Female	Intern	10 MONTHS	620	621	622	624	625	618	610	599	598	596	595	588	590	591	592	594	595	599	600	601	600	610	610	610	34	34	34
80	1180888	72	120/78	98	18	23	Male	Intern	10 MONTHS	299	298	297	300	301	302	310	302	310	311	309	310	311	312	310	311	312	306	308	309	308	310	309	309	27	27	26
81	1180422	82	130/78	99	18	26	Female	JR-3 YEAR	2-YEARS	375	300	289	299	300	301	302	303	302	302	304	305	310	312	313	315	317	318	320	321	320	319	318	320	30	29	29
82	1181397	80	130/80	98	16	26	Female	JR-1 YEAR	1 YEAR	322	324	325	316	318	320	322	340	330	346	347	350	361	345	341	342	342	343	345	346	345	340	336	332	30	29	30
83	1183046	70	120/76	99	16	23	Male	Intern	10 MONTHS	320	324	350	348	340	348	360	370	375	376	374	376	378	340	345	350	355	380	381	365	370	381	380	378	29	28	28
84	1175742	82	110/70	99	16	26	Female	JR-1 YEAR	1 YEAR	420	410	412	400	410	420	421	405	406	410	420	422	421	420	418	416	420	400	410	412	414	416	417	418	29	29	29
85	1028275	72	110/70	100	18	23	Male	Intern	10 MONTHS	400	390	391	392	395	396	397	390	386	367	380	381	375	376	377	388	390	379	380	381	375	380	381	379	29	29	29
86	1181402	78	120/80	99	18	23	Male	Intern	10 MONTHS	550	552	554	552	550	545	546	547	548	549	550	552	553	560	545	546	546	547	548	546	546	555	556	557	32	30	31
87	1177603	72	110/70	99	16	22	Male	Intern	10 MONTHS	452	450	451	455	438	437	438	439	440	441	442	428	424	425	426	425	422	426	450	435	420	421	422	421	30	30	30
88	1002352	72	130/70	100	16	23	Male	Intern	10 MONTHS	450	452	452	440	442	440	442	444	445	450	466	480	481	482	481	466	470	474	470	477	478	500	499	488	32	31	32
89	1180428	84	134/78	100	16	23	Male	Intern	10 MONTHS	290	288	289	290	299	286	270	288	300	299	298	288	300	301	305	307	310	300	301	306	320	316	315	314	26	26	26
90	1156148	72	126/78	100	16	23	Male	Intern	10 MONTHS	355	350	351	352	360	355	350	351	351	326	320	320	325	326	327	350	327	340	346	312	310	312	313	313	29	29	28
91	1186168	72	130/90	99	16	24	Male	Intern	10 MONTHS	346	342	322	321	322	330	345	340	342	350	326	324	322	310	320	321	299	298	300	301	302	301	300	300	29	28	29
92	1166778	72	130/82	99	18	23	Female	Intern	10 MONTHS	335	345	325	320	322	340	313	300	300	304	314	315	301	320	310	330	310	295	296	300	310	314	310	300	30	29	28
93	1186448	70	120/72	100	18	26	Female	JR-1YEAR	1 YEAR	520	521	504	515	525	540	550	514	520	525	514	520	521	522	524	560	515	500	515	505	510	511	505	516	32	31	30
94	1115367	80	130/79	100	18	23	Female	Intern	10 MONTHS	298	298	296	300	310	311	312	320	300	310	316	330	320	333	343	340	340	341	342	344	343	344	320	321	28	28	29
95	691816	72	110/78	99	16	24	Male	Intern	10 MONTHS	326	340	388	350	354	354	351	352	348	380	415	400	406	407	410	412	400	412	400	402	413	400	399	398	30	30	30
96	1184918	92	130/90	100	16	23	Female	Intern	10 MONTHS	550	560	566	564	565	564	562	564	563	562	562	566	564	570	576	577	568	569	570	568	572	573	574	580	32	32	32
97	1194707	84	128/78	99	18	23	Female	Intern	10 MONTHS	540	555	570	571	572	574	576	574	580	594	564	584	588	590	591	585	584	586	584	588	564	565	566	567	32	32	34
98	1182276	90	130/86	100	14	24	Female	Intern	10 MONTHS	275	280	299	300	301	298	299	304	305	306	316	320	306	324	350	325	318	304	318	312	309	310	312	320	25	24	25
99	1194602	74	132/72	99	16	23	Female	Intern	10 MONTHS	280	289	290	298	298	297	296	297	300	298	288	298	300	301	288	300	299	300	301	302	300	301	304	298	24	24	25
100	742376	82	130/72	99	16	23	Female	Intern	10 MONTHS	355	360	388	389	390	400	445	435	434	432	433	434	435	436	437	436	435	435	450	452	452	453	445	450	30	29	29
101	1191705	84	130/78	100	18	23	Female	Intern	10 MONTHS	289	299	298	296	300	296	297	298	300	301	300	299	300	301	299	298	289	300	304	298	300	295	296	299	27	26	25
102	1197232	80	130/70	100	16	23	Female	Intern	10 MONTHS	454	452	450	425	430	431	455	454	450	444	445	446	450	452	455	456	457	432	444	445	460	464	462	463	32	32	33
103	1154941	78	120/82	99	16	23	Female	Intern	10 MONTHS	355	380	381	378	376	370	372	374	380	381	382	383	390	388	400	405	400	401	402	404	410	411	420	422	29	28	28
104	1093459	68	120/72	99	14	24	Female	Intern	10 MONTHS	650	654	650	666	648	630	631	632	632	632	630	640	630	620	620	625	626	627	620	610	620	621	625	620	34	34	34
105	1192931	84	128/74	99	16	26	Female	JR-1 YEAR	1 YEAR	420	424	420	422	424	422	420	422	424	430	422	410	420	414	415	416	412	420	421	422	423	420	418	420	29	28	28
106	1198166	75	120/72	98	16	23	Female	Intern	10 MONTHS	478	467	468	420	398	396	400	402	450	454	455	428	421	425	426	450	451	438	438	431	432	433	428	422	29	28	28
107	438915	72	110/78	99	16	25	Male	Intern	10 MONTHS	520	521	522	524	525	526	524	540	555	545	538	536	537	538	539	540	544	544	545	545	530	531	532	533	33	32	33
108	1043493	82	110/72	100	15	23	Male	Intern	10 MONTHS	0	0	250	252	258	258	258	250	261	300	304	310	310	318	308	310	311	312	320	318	299	300	304	304	0	0	26
109	1163201	90	110/68	98	15	23	Female	Intern	10 MONTHS	620	624	625	626	618	620	621	618	599	598	600	602	604	605	606	610	620	622	618	620	622	622	618	620	33	33	34
110	538485	74	120/90	99	15	24	Male	Intern	10 MONTHS	292	299	288	300	301	299	300	325	310	314	315	320	321	322	325	318	344	345	350	344	345	346	350	348	28	29	29
111	587337	67	120/78	100	18	24	Male	Intern	10 MONTHS	420	422	423	424	423	424	445	450	444	450	446	447	446	450	451	460	466	470	471	480	476	460	466	452	30	30	31
112	1205017	90	130/88	99	14	23	Male	Intern	10 MONTHS	250	252	252	254	220	240	241	242	250	255	266	267	300	310	310	312	310	299	298	300	301	315	310	310	26	26	23
113	203214	87	120/72	99	14	23	Female	Intern	10 MONTHS	355	356	348	346	347	348	350	351	352	353	352	353	352	353	354	352	348	349	350	348	336	340	341	345	29	29	29
114	1207548	88	130/90	99	16	23	Male	Intern	10 MONTHS	560	562	562	564	565	566	567	545	550	552	545	525	526	527	588	589	578	576	577	550	560	565	567	568	33	33	33
115	1180675	82	130/70	99	16	24	Male	Intern	10 MONTHS	420	421	422	420	421	420	422	420	422	424	420	430	418	420	422	428	429	420	428	419	420	422	420	422	29	29	29
116	1211089	72	128/78	99	16	23	Male	Intern	10 MONTHS	350	355	340	344	345	350	345	350	322	333	343	344	345	346	343	345	346	347	343	344	345	346	344	345	27	27	28
117	1213442	90	130/84	98	18	24	Male	Intern	10 MONTHS	320	324	325	330	324	325	299	298	300	301	302	301	328	318	320	321	322	330	345	350	355	350	352	351	26	27	27
118	1213827	88	120/72	98	18	23	Male	Intern	10 MONTHS	385	380	378	379	380	382	384	400	404	410	420	418	450	455	438	439	440	445	445	448	450	449	448	450	29	29	28
119	1213392	78	120/82	99	18	23	Male	Intern	10 MONTHS	420	421	422	423	424	428	450	525	525	520	510	500	495	496	500	501	499	498	498	489	500	510	498	499	30	30	30
120	1215814	72	130/90	98	16	23	Male	Intern	10 MONTHS	320	321	322	323	340	345	340	341	345	350	328	321	324	325	326	327	328	324	325	326	327	340	341	328	26	27	27
121	1169485	72	120/78	99	16	23	Female	Intern	10 MONTHS	500	520	521	522	530	531	534	530	534	535	536	540	545	555	540	544	542	542	545	540	530	535	536	538	32	32	32
122	1213870	78	110/70	98	16	24	Female	Intern	10 MONTHS	279	278	280	281	278	300	301	302	310	322	298	299	300	301	304	320	324	325	318	320	318	319	340	338	27	27	28
123	1218932	84	120/84	98	18	23	Male	Intern	10 MONTHS	355	348	349	350	352	354	355	356	357	358	354	338	339	350	348	342	328	340	345	346	350	345	341	342	29	29	30
124	1218983	88	130/80	98	16	24	Male	Intern	10 MONTHS	398	398	384	385	400	401	399	398	400	400	398	388	378	376	380	389	390	398	399	398	399	398	399	398	28	27	28
125	1219150	80	120/72	99	15	27	Female	JR-3 YEAR	2 YEARS	258	268	270	269	269	270	272	273	274	275	280	290	288	290	298	296	297	296	298	276	278	279	299	289	26	26	27
126	1220663	74	130/72	98	16	23	Male	Intern	10 MONTHS	385	390	395	396	395	394	392	388	385	387	390	389	390	385	386	390	385	386	384	390	399	400	402	400	30	30	29
127	1118908	72	128/74	99	18	23	Male	Intern	10 MONTHS	650	654	648	638	634	635	634	650	645	638	639	640	645	645	638	640	641	642	638	639	640	641	640	643	32	32	33
128	697050	74	120/72	100	18	26	Female	JR-3 YEAR	2 YEARS	355	354	355	356	355	345	355	356	355	356	354	355	354	352	345	346	347	348	344	345	346	344	345	350	28	28	28
129	1208608	84	110/70	99	14	23	Male	Intern	10 MONTHS	488	489	480	484	484	485	478	476	486	478	476	477	476	488	468	468	468	467	468	469	460	470	488	480	32	32	32
130	1203430	74	128/78	99	15	27	Female	JR-3 YEAR	2 YEARS	350	355	354	355	356	357	358	359	356	359	355	356	344	345	346	350	351	355	356	355	356	355	345	355	29	29	29
131	1222681	84	130/90	100	17	23	Male	Intern	10 MONTHS	482	482	481	482	483	484	485	483	484	483	484	482	482	481	481	480	481	480	481	480	481	480	480	480	32	31	31
132	979831	78	124/72	100	17	23	Male	Intern	10 MONTHS	525	524	525	524	528	530	531	529	529	530	531	532	532	530	540	541	542	543	544	545	544	545	546	546	34	34	34

S. No.	MRD No.	$EtCO_2(4)$	$EtCO_2(5)$	$EtCO_2(6)$	$EtCO_2(7)$	$EtCO_2(8)$	$EtCO_2(9)$	$EtCO_2(10)$	$EtCO_2(11)$	$EtCO_2(12)$	$EtCO_2(13)$	$EtCO_2(14)$	$EtCO_2(15)$	$EtCO_2(16)$	$EtCO_2(17)$	$EtCO_2(18)$	$EtCO_2(19)$	$EtCO_2(20)$	$EtCO_2(21)$	$EtCO_2(22)$	$EtCO_2(23)$	$EtCO_2(24)$	$SpO_2(1)$	$SpO_2(2)$	$SpO_2(3)$	$SpO_2(4)$	$SpO_2(5)$
68	1130031	26	27	26	25	26	27	26	26	26	26	27	28	26	27	27	26	27	27	26	26	26	100	100	100	100	100
69	846160	30	31	30	31	30	31	30	31	30	30	30	31	30	32	32	32	32	32	32	32	32	100	100	100	100	100
70	1167868	28	28	28	28	29	29	29	28	28	28	28	29	29	28	28	28	29	29	29	29	28	100	100	100	100	100
71	1168918	32	32	32	32	33	32	32	32	32	33	32	32	32	33	32	32	33	33	33	32	32	100	100	100	100	100
72	1171068	33	32	31	30	31	30	31	31	31	32	32	30	31	31	32	32	31	33	33	32	32	100	100	100	100	100
73	1171945	32	32	32	32	33	33	32	33	32	33	32	33	34	33	32	32	32	32	32	32	32	100	100	100	100	100
74	1175068	32	32	31	32	32	32	32	32	32	32	32	31	30	31	32	32	32	31	31	31	31	100	100	100	100	100
75	1174575	28	29	29	29	29	29	29	28	29	28	28	28	29	29	29	29	29	28	28	28	28	100	100	100	100	100
76	1168169	28	27	27	28	28	28	28	29	29	29	29	29	28	28	29	29	28	29	29	29	29	100	100	100	100	100
77	1177046	33	32	33	32	33	32	33	33	32	33	32	33	34	33	33	33	32	33	33	33	33	100	100	100	100	100
78	1177636	33	33	33	34	33	32	33	34	34	34	35	35	34	34	34	34	34	33	33	32	33	100	100	100	100	100
79	1176164	33	33	33	34	34	33	33	34	33	34	34	34	33	33	34	34	33	33	33	33	34	100	100	100	100	100
80	1180888	26	26	26	26	26	26	26	26	27	26	26	26	26	27	27	27	26	26	26	26	26	100	100	100	100	100
81	1180422	29	28	28	28	28	29	29	28	28	29	29	28	28	28	28	29	29	29	29	29	29	100	100	100	100	100
82	1181397	29	29	29	29	29	29	30	30	30	30	30	29	29	29	29	29	29	28	29	29	29	100	100	100	100	100
83	1183046	27	28	28	29	29	28	28	28	29	28	28	28	28	27	27	27	27	28	28	27	27	100	100	100	100	100
84	1175742	30	30	29	30	30	30	29	29	30	31	30	30	31	31	30	31	30	31	30	30	30	100	100	100	100	100
85	1028275	28	28	28	29	29	29	28	28	28	28	29	29	29	29	28	28	29	29	28	28	28	100	100	100	100	100
86	1181402	30	31	31	31	32	32	32	32	32	32	33	32	33	32	33	33	32	32	32	32	33	100	100	100	100	100
87	1177603	31	31	29	29	28	29	30	30	30	31	30	30	30	30	31	30	30	31	30	31	30	100	100	100	100	100
88	1002352	32	32	32	31	31	31	31	31	31	30	30	31	31	30	30	30	31	31	30	31	30	100	100	100	100	100
89	1180428	27	26	26	26	27	26	26	27	26	26	26	26	27	27	27	26	26	26	27	27	26	100	100	100	100	100
90	1156148	27	27	27	26	27	27	27	26	26	27	26	26	27	28	27	26	26	27	27	26	26	100	100	100	100	100
91	1186168	29	28	28	28	29	29	29	28	28	28	29	28	27	28	28	27	28	27	26	27	27	100	100	100	100	100
92	1166778	29	28	27	27	27	26	27	27	26	27	28	28	27	28	28	28	29	29	28	28	29	100	100	100	100	100
93	1186448	31	30	31	30	30	31	30	31	30	31	31	30	31	32	32	31	32	32	32	31	30	100	100	100	100	100
94	1115367	29	28	29	29	29	28	27	27	27	28	27	27	28	28	29	28	27	27	26	26	27	100	100	100	100	100
95	691816	30	29	29	29	28	29	29	29	29	30	30	30	29	29	29	29	29	30	30	30	30	100	100	100	100	100
96	1184918	33	33	32	32	33	33	33	32	33	32	33	32	33	33	32	33	33	34	34	33	33	100	100	100	100	100
97	1194707	33	34	33	32	32	33	33	32	33	33	32	32	32	32	32	32	31	32	32	32	32	100	100	100	100	100
98	1182276	25	25	24	24	25	26	24	24	25	25	25	25	24	24	24	25	26	24	24	24	25	100	100	100	100	100
99	1194602	24	24	24	24	25	24	24	24	25	24	24	24	25	25	24	24	26	26	26	25	25	100	100	100	100	100
100	742376	30	30	30	29	29	29	28	29	29	29	30	30	29	29	28	28	29	29	29	28	28	100	100	100	100	100
101	1191705	24	24	25	26	27	27	27	27	26	27	26	26	26	25	24	24	25	25	26	26	26	100	100	100	100	100
102	1197232	32	31	30	31	32	32	32	33	32	32	32	31	31	32	33	32	32	33	33	32	33	100	100	100	100	100
103	1154941	28	27	28	28	28	29	28	28	28	28	27	28	28	29	29	29	29	28	27	28	28	100	100	100	100	100
104	1093459	33	33	33	34	34	33	34	34	34	33	34	33	34	33	34	33	34	34	34	34	33	100	100	100	100	100
105	1192931	29	29	29	29	28	28	28	28	28	29	29	29	29	28	29	28	28	28	29	29	29	100	100	100	100	100
106	1198166	28	29	29	28	28	27	27	28	28	28	27	26	27	27	26	25	24	25	25	26	26	100	100	100	100	100
107	438915	32	32	33	32	33	32	33	34	33	32	33	34	33	32	33	34	34	33	33	34	33	100	100	100	100	100
108	1043493	24	25	25	24	24	24	25	25	26	27	28	27	27	26	26	27	27	28	28	27	27	100	100	100	100	100
109	1163201	34	34	34	33	33	34	34	34	34	34	33	32	33	33	34	34	34	34	33	33	34	100	100	100	100	100
110	538485	28	28	28	29	29	29	29	28	27	27	27	28	29	29	28	28	29	29	29	29	28	100	100	100	100	100
111	587337	30	31	30	30	30	31	30	31	31	31	30	31	30	30	30	31	31	32	31	31	31	100	100	100	100	100
112	1205017	24	24	24	23	23	23	24	24	24	24	23	23	24	24	25	24	25	25	25	25	26	100	100	100	100	100
113	203214	28	29	29	28	28	29	28	28	29	29	30	29	29	29	30	28	29	29	28	29	29	100	100	100	100	100
114	1207548	34	34	34	33	33	33	33	33	34	34	34	34	34	33	33	34	33	33	34	34	34	100	100	100	100	100
115	1180675	29	29	28	28	29	29	28	29	29	29	29	29	28	28	28	29	29	29	28	28	28	100	100	100	100	100
116	1211089	29	28	28	29	29	29	29	28	28	28	28	27	27	27	26	27	27	27	27	26	27	100	100	100	100	100
117	1213442	28	29	29	28	28	29	29	28	28	28	29	29	29	28	27	27	27	28	28	28	28	100	100	100	100	100
118	1213827	30	30	31	30	29	29	29	30	30	30	30	30	29	29	29	30	30	30	31	31	31	100	100	100	100	100
119	1213392	31	30	30	31	30	31	31	30	30	31	30	30	31	30	30	30	31	30	30	30	30	100	100	100	100	100
120	1215814	28	28	27	27	27	27	26	27	26	26	26	27	26	26	26	26	26	26	26	26	26	100	100	100	100	100
121	1169485	32	31	32	31	32	32	32	32	32	33	33	32	32	32	33	32	33	32	32	33	32	100	100	100	100	100
122	1213870	29	28	27	26	27	28	28	28	29	28	28	27	27	27	28	27	28	27	28	27	27	100	100	100	100	100
123	1218932	30	30	30	29	29	28	29	29	28	28	28	28	28	28	28	29	29	28	28	28	29	100	100	100	100	100
124	1218983	28	27	28	29	28	30	30	29	29	29	29	28	29	29	28	29	28	29	30	29	29	100	100	100	100	100
125	1219150	26	26	26	26	25	25	26	25	26	25	25	25	26	25	25	25	26	25	25	26	26	100	100	100	100	100
126	1220663	29	30	30	31	31	31	30	31	31	30	30	30	31	31	30	31	31	31	30	31	31	100	100	100	100	100
127	1118908	33	32	33	33	32	33	32	33	33	33	32	33	34	33	33	34	34	33	34	33	34	100	100	100	100	100
128	697050	27	27	28	28	29	28	28	29	28	28	29	29	29	29	28	28	28	28	29	29	29	100	100	100	100	100
129	1208608	32	31	31	31	32	32	32	32	31	32	32	31	32	32	32	32	32	31	31	32	32	100	100	100	100	100
130	1203430	29	29	29	28	28	29	28	28	28	29	29	29	29	28	28	28	29	29	28	28	28	100	100	100	100	100
131	1222681	32	31	32	32	32	33	33	33	34	34	34	34	34	33	33	33	33	33	34	34	34	100	100	100	100	100
132	979831	34	34	34	33	34	34	34	33	34	34	34	33	34	32	33	34	34	33	34	33	34	100	100	100	100	100

S. No.	MRD No.	SpO_2(6)	SpO_2(7)	SpO_2(8)	SpO_2(9)	SpO_2(10)	SpO_2(11)	SpO_2(12)	SpO_2(13)	SpO_2(11)	SpO_2(12)	SpO_2(13)	SpO_2(14)	SpO_2(15)	SpO_2(16)	SpO_2(17)	SpO_2(18)	SpO_2(19)	SpO_2(20)	SpO_2(21)	SpO_2(22)	SpO_2(23)	SpO_2(24)	Failed breath (yes/no)	Total number of failed breaths	Failed breath (FB) 1	FB2	FB3	FB4	FB5
68	1130031	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
69	846160	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
70	1167868	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
71	1168918	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
72	1171068	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
73	1171945	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
74	1175068	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
75	1174575	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
76	1168169	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
77	1177046	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
78	1177636	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
79	1176164	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
80	1180888	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
81	1180422	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
82	1181397	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
83	1183046	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
84	1175742	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
85	1028275	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
86	1181402	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
87	1177603	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
88	1002352	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
89	1180428	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
90	1156148	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
91	1186168	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
92	1166778	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
93	1186448	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
94	1115367	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
95	691816	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
96	1184918	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
97	1194707	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
98	1182276	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
99	1194602	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
100	742376	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
101	1191705	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
102	1197232	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
103	1154941	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
104	1093459	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
105	1192931	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
106	1198166	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
107	438915	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
108	1043493	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	yes	2	1	1	0	0	0
109	1163201	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
110	538485	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
111	587337	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
112	1205017	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
113	203214	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
114	1207548	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
115	1180675	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
116	1211089	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
117	1213442	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
118	1213827	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
119	1213392	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
120	1215814	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
121	1169485	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
122	1213870	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
123	1218932	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
124	1218983	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
125	1219150	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
126	1220663	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
127	1118908	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
128	697050	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
129	1208608	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
130	1203430	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
131	1222681	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0
132	979831	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	no	0	0	0	0	0	0

S. No.	MRD No.	FB6	FB7	FB8	FB9	FB10	FB11	FB12	FB13	FB14	FB15	FB16	FB17	FB18	FB19	FB20	FB21	FB22	FB23	FB24	HR 1	HR 2	HR 3	HR 4	HR 5	HR 6	HR 7	HR 8	HR 9	HR 10	HR 11	HR 12	HR 13	HR 14	HR 15	HR 16	HR 17	HR 18	HR 19	HR 20	HR 21	HR 22	HR 23	HR 24
68	1130031	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	89	88	89	90	89	88	88	89	88	88	87	86	87	88	88	89	89	88	87	88	87	87	86
69	846160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	77	76	77	78	76	78	78	77	76	79	80	81	82	80	81	80	80	81	80	81	82	80	80
70	1167868	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	80	82	80	80	80	82	81	80	81	82	82	80	80	81	82	82	81	82	82	82	81	82
71	1168918	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	80	82	80	81	82	82	80	80	81	80	81	82	81	82	82	82	82	84	84	84	83	83
72	1171068	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	78	77	76	77	76	76	77	76	76	76	76	76	77	76	77	78	77	76	77	78	78		
73	1171945	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	91	92	91	90	90	91	90	90	90	89	88	89	90	89	89	88	88	88	89	89	89		
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80	1180888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	81	80	81	80	81	80	80	78	79	79	78	79	80	81	80	81	80	80	80	78		
81	1180422	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	81	80	81	81	82	82	80	80	80	81	81	80	80	80	81	81	81	82	81	81	81		
82	1181397	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	78	77	76	78	79	80	80	79	79	78	79	78	80	80	79	79	78	79	79	80		
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84	1175742	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	70	72	70	71	72	72	73	74	74	75	74	73	73	73	72	72	72	70	72	72		
85	1028275	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	69	68	67	68	69	69	68	69	70	69	68	69	69	68	68	69	70	69	69	68	69		
86	1181402	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	81	80	81	81	80	82	82	81	80	82	82	82	83	82	82	81	82	82	82	81	80		
87	1177603	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	82	78	78	76	78	77	78	78	78	77	77	77	77	78	79	78	78	77	76	77		
88	1002352	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	81	79	78	79	80	81	80	78	78	79	79	78	79	78	79	79	79	78	78	77	78		
89	1180428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	83	82	80	81	82	82	81	80	81	82	82	81	80	81	80	81	80	81	82	81	81		
90	1156148	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	74	76	75	76	74	74	74	75	76	74	75	74	75	76	75	74	74	74	74	74	75	75	74
91	1186168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	80	80	80	78	79	79	80	78	79	79	80	81	80	81	80	80	81	80	78	79	79	80
92	1166778	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	78	78	76	75	74	72	72	73	74	73	72	73	74	73	72	73	75	76	74	73	72	72	72
93	1186448	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	74	73	72	70	74	72	72	71	72	72	71	72	72	70	71	72	72	72	70	70	70	71	71
94	1115367	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	82	82	83	82	82	80	80	82	84	82	83	82	84	83	82	80	82	82	83	82	84	83
95	691816	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	74	74	72	72	72	72	73	72	72	73	73	74	73	73	73	72	72	72	71	72	72	71	70
96	1184918	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91	92	91	91	90	91	90	91	90	91	91	92	92	91	91	92	92	91	91	91	92	92	91	91
97	1194707	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	84	84	84	82	82	84	84	84	84	83	82	82	83	83	82	82	82	83	83	84	83	83
98	1182276	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	91	90	90	89	88	89	90	89	89	88	88	89	89	88	88	89	89	89	88	88	88	89	89
99	1194602	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	69	69	68	69	68	68	68	69	70	69	68	69	69	69	68	69	69	69	68	69	69	69
100	742376	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	80	78	77	76	77	78	77	76	75	76	75	74	73	72	73	73	74	74	73	74	73	72	72
101	1191705	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	82	83	82	82	83	82	82	83	84	83	83	84	83	82	80	81	80	80	81	80	81	82	82
102	1197232	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	72	73	72	71	70	71	72	70	72	73	74	72	74	73	72	70	71	70	72	72	72	72	74
103	1154941	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	73	74	74	75	74	75	74	73	72	73	73	72	73	74	73	74	73	72	72	73	72	72
104	1093459	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	68	67	68	68	69	68	68	68	67	68	66	66	66	67	68	68	69	68	68	68	69	69	69
105	1192931	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71	72	72	72	73	72	74	73	73	72	72	73	72	73	74	73	72	73	72	73	72	73	72	72
106	1198166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	67	66	68	68	68	69	69	69	69	69	70	69	69	68	69	70	69	68	68	69	68	68	69
107	438915	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	73	72	73	73	73	72	73	73	73	72	73	73	74	73	72	72	73	73	72	72	73	73	72
108	1043493	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	70	68	68	67	67	66	67	68	68	67	67	67	68	68	68	68	69	68	68	67	67	68	68
109	1163201	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82	80	80	81	80	81	80	81	82	82	83	82	82	81	80	81	80	81	82	81	82	82	82	82
110	538485	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	73	72	73	73	73	72	72	73	74	73	72	72	72	72	73	72	71	70	70	70	71	70	70
111	587337	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	68	69	67	67	68	68	68	69	69	68	68	69	69	68	68	69	69	68	68	67	68	68	68
112	1205017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	79	78	80	81	82	82	82	81	81	82	82	83	84	85	86	87	86	86	85	84	84	85	85
113	203214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	76	77	76	77	78	77	76	77	76	77	76	77	76	78	79	78	77	76	77	78	79	78	77
114	1207548	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	80	80	79	78	79	79	78	78	77	76	77	78	78	77	76	77	76	77	76	77	78	79	78
115	1180675	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	74	74	74	72	73	72	74	73	72	72	71	72	72	73	72	72	73	72	72	73	74	73	72
116	1211089	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	77	76	74	73	72	71	70	71	70	71	70	71	72	72	72	71	72	72	72	71	71	71	72
117	1213442	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	90	91	90	90	89	89	89	89	88	88	87	88	88	89	89	88	88	89	89	88	88	88	89
118	1213827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	88	87	86	86	86	85	86	86	85	85	85	86	86	84	84	85	84	85	85	85	86	85	85	85
119	1213392	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	76	74	75	76	76	77	76	75	74	75	76	77	76	77	78	77	76	77	78	79	78	79	79
120	1215814	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	71	70	71	72	71	72	71	71	70	71	71	70	71	71	72	71	71	70	71	70	71	70
121	1169485	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	78	78	77	76	74	75	76	75	74	75	76	77	76	75	76	77	78	78	79	79	78	79	78
122	1213870	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	73	74	73	72	72	73	74	73	72	74	73	72	72	71	72	73	72	72	72	73	72	73
123	1218932	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68	69	70	71	70	70	70	70	70	69	68	69	69	69	70	70	69	69	68	69	69	69	68	70
124	1218983	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	78	79	79	78	79	80	80	81	82	81	80	81	80	81	80	80	79	78	80	81	80	80	81
125	1219150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	80	79	78	77	79	79	78	79	79	78	79	79	78	80	81	80	81	80	79	79	79	78	78
126	1220663	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	73	74	73	72	74	73	74	73	73	72	73	73	74	73	73	72	73	74	72	72	73	73
127	1118908	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80	80	81	80	81	82	82	83	82	82	81	82	82	81	80	81	80	81	81	82	82	81	80	81
128	697050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	73	73	74	72	72	72	72	73	73	72	73	73	73	72	72	72	73	73	73	72	73	74	73
129	1208608	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	73	73	72	72	73	74	73	72	72	72	72	73	74	73	73	72	72	72	73	73	72	72	72
130	1203430	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	73	73	73	72	72	73	72	72	72	71	71	70	71	70	70	71	70	70	70	70	71	72
131	1222681	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	82	82	81	80	79	78	78	78	78	78	77	76	77	76	77	76	77	78	77	77	77	72	72
132	979831	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	72	73	74	73	72	74	73	74	74	73	72	72	73	74	75	76	77	78	77	76	77	76	77

S. No.	MRD No.	NIBP 1	NIBP 2	NIBP 3	NIBP 4	NIBP 5	NIBP 6	NIBP 7	NIBP 8	NIBP 9	NIBP 10	NIBP 11	NIBP 12	NIBP 13	NIBP 14	NIBP 15	NIBP 16	NIBP 17	NIBP 18	NIBP 19	NIBP 20	NIBP 21	NIBP 22	NIBP 23	NIBP 24	ECG RHYTHM 1	ECG RHYTHM 2	ECG RHYTHM 3	ECG RHYTHM 4	ECG RHYTHM 5	ECG RHYTHM 6
68	1130031	122/68	122/68	122/68	122/68	122/68	122/68	122/68	122/68	122/68	122/68	122/68	122/68	120/64	120/64	120/64	120/64	120/64	120/64	120/64	120/64	120/64	120/64	120/64	120/64	NSR	NSR	NSR	NSR	NSR	NSR
69	846160	110/78	110/78	110/78	110/78	110/78	110/78	110/78	110/78	110/78	110/78	110/78	110/78	108/72	108/72	108/72	108/72	108/72	108/72	108/72	108/72	108/72	108/72	108/72	108/72	NSR	NSR	NSR	NSR	NSR	NSR
70	1167868	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	NSR	NSR	NSR	NSR	NSR	NSR
71	1168918	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	NSR	NSR	NSR	NSR	NSR	NSR
72	1171068	110/60	110/60	110/60	110/60	110/60	110/60	110/60	110/60	110/60	110/60	110/60	110/60	100/60	100/60	100/60	100/60	100/60	100/60	100/60	100/60	100/60	100/60	100/60	100/60	NSR	NSR	NSR	NSR	NSR	NSR
73	1171945	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	120/74	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	116/72	NSR	NSR	NSR	NSR	NSR	NSR
74	1175068	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	100/64	100/64	100/64	100/64	100/64	100/64	100/64	100/64	100/64	100/64	100/64	100/64	NSR	NSR	NSR	NSR	NSR	NSR
75	1174575	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	102/68	100/66	100/66	100/66	100/66	100/66	100/66	100/66	100/66	100/66	100/66	100/66	100/66	NSR	NSR	NSR	NSR	NSR	NSR
76	1168169	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	NSR	NSR	NSR	NSR	NSR	NSR
77	1177046	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	NSR	NSR	NSR	NSR	NSR	NSR
78	1177636	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	NSR	NSR	NSR	NSR	NSR	NSR
79	1176164	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	108/70	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	106/68	NSR	NSR	NSR	NSR	NSR	NSR
80	1180888	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	118/67	118/67	118/67	118/67	118/67	118/67	118/67	118/67	118/67	118/67	118/67	118/67	NSR	NSR	NSR	NSR	NSR	NSR
81	1180422	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	118/62	118/62	118/62	118/62	118/62	118/62	118/62	118/62	118/62	118/62	118/62	118/62	NSR	NSR	NSR	NSR	NSR	NSR
82	1181397	130/88	130/88	130/88	130/88	130/88	130/88	130/88	130/88	130/88	130/88	130/88	130/88	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	NSR	NSR	NSR	NSR	NSR	NSR
83	1183046	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	NSR	NSR	NSR	NSR	NSR	NSR
84	1175742	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	NSR	NSR	NSR	NSR	NSR	NSR
85	1028275	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	NSR	NSR	NSR	NSR	NSR	NSR
86	1181402	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	NSR	NSR	NSR	NSR	NSR	NSR
87	1177603	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	NSR	NSR	NSR	NSR	NSR	NSR
88	1002352	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	NSR	NSR	NSR	NSR	NSR	NSR
89	1180428	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	NSR	NSR	NSR	NSR	NSR	NSR
90	1156148	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	112/68	NSR	NSR	NSR	NSR	NSR	NSR
91	1186168	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	NSR	NSR	NSR	NSR	NSR	NSR
92	1166778	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	NSR	NSR	NSR	NSR	NSR	NSR
93	1186448	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	NSR	NSR	NSR	NSR	NSR	NSR
94	1115367	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	NSR	NSR	NSR	NSR	NSR	NSR
95	691816	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	104/68	NSR	NSR	NSR	NSR	NSR	NSR
96	1184918	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	130/78	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	124/70	NSR	NSR	NSR	NSR	NSR	NSR
97	1194707	103/67	103/67	103/67	103/67	103/67	103/67	103/67	103/67	103/67	103/67	103/67	103/67	102/64	102/64	102/64	102/64	102/64	102/64	102/64	102/64	102/64	102/64	102/64	102/64	NSR	NSR	NSR	NSR	NSR	NSR
98	1182276	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	NSR	NSR	NSR	NSR	NSR	NSR
99	1194602	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	106/62	106/62	106/62	106/62	106/62	106/62	106/62	106/62	106/62	106/62	106/62	106/62	NSR	NSR	NSR	NSR	NSR	NSR
100	742376	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	124/76	126/78	126/78	126/78	126/78	126/78	126/78	126/78	126/78	126/78	126/78	126/78	126/78	NSR	NSR	NSR	NSR	NSR	NSR
101	1191705	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	118/76	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	NSR	NSR	NSR	NSR	NSR	NSR
102	1197232	128/72	128/72	128/72	128/72	128/72	128/72	128/72	128/72	128/72	128/72	128/72	128/72	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	NSR	NSR	NSR	NSR	NSR	NSR
103	1154941	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	NSR	NSR	NSR	NSR	NSR	NSR
104	1093459	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	NSR	NSR	NSR	NSR	NSR	NSR
105	1192931	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	126/76	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	116/74	NSR	NSR	NSR	NSR	NSR	NSR
106	1198166	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	108/64	108/64	108/64	108/64	108/64	108/64	108/64	108/64	108/64	108/64	108/64	108/64	NSR	NSR	NSR	NSR	NSR	NSR
107	438915	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	NSR	NSR	NSR	NSR	NSR	NSR
108	1043493	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	NSR	NSR	NSR	NSR	NSR	NSR
109	1163201	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	106/64	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	104/62	NSR	NSR	NSR	NSR	NSR	NSR
110	538485	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	NSR	NSR	NSR	NSR	NSR	NSR
111	587337	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	109/66	109/66	109/66	109/66	109/66	109/66	109/66	109/66	109/66	109/66	109/66	109/66	NSR	NSR	NSR	NSR	NSR	NSR
112	1205017	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	120/72	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	116/68	NSR	NSR	NSR	NSR	NSR	NSR
113	203214	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	NSR	NSR	NSR	NSR	NSR	NSR
114	1207548	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	124/72	NSR	NSR	NSR	NSR	NSR	NSR
115	1180675	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	NSR	NSR	NSR	NSR	NSR	NSR
116	1211089	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	120/70	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	NSR	NSR	NSR	NSR	NSR	NSR
117	1213442	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	128/78	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	118/69	NSR	NSR	NSR	NSR	NSR	NSR
118	1213827	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	114/74	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	NSR	NSR	NSR	NSR	NSR	NSR
119	1213392	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	NSR	NSR	NSR	NSR	NSR	NSR
120	1215814	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	112/70	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	NSR	NSR	NSR	NSR	NSR	NSR
121	1169485	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	116/70	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	114/68	NSR	NSR	NSR	NSR	NSR	NSR
122	1213870	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	118/72	NSR	NSR	NSR	NSR	NSR	NSR
123	1218932	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	109/64	109/64	109/64	109/64	109/64	109/64	109/64	109/64	109/64	109/64	109/64	109/64	NSR	NSR	NSR	NSR	NSR	NSR
124	1218983	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	118/68	NSR	NSR	NSR	NSR	NSR	NSR
125	1219150	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	114/70	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	110/68	NSR	NSR	NSR	NSR	NSR	NSR
126	1220663	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	114/64	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	108/60	NSR	NSR	NSR	NSR	NSR	NSR
127	1118908	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	120/68	NSR	NSR	NSR	NSR	NSR	NSR
128	697050	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	114/72	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	NSR	NSR	NSR	NSR	NSR	NSR
129	1208608	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	110/70	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	NSR	NSR	NSR	NSR	NSR	NSR
130	1203430	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	112/72	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	108/68	NSR	NSR	NSR	NSR	NSR	NSR
131	1222681	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	124/74	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	NSR	NSR	NSR	NSR	NSR	NSR
132	979831	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	122/72	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	118/70	NSR	NSR	NSR	NSR	NSR	NSR

S. No.	MRD No.	ECG RHYTHM 7	ECG RHYTHM 8	ECG RHYTHM 9	ECG RHYTHM 10	ECG RHYTHM 11	ECG RHYTHM 12	ECG RHYTHM 13	ECG RHYTHM 14	ECG RHYTHM 15	ECG RHYTHM 16	ECG RHYTHM 17	ECG RHYTHM 18	ECG RHYTHM 19	ECG RHYTHM 20	ECG RHYTHM 21	ECG RHYTHM 22	ECG RHYTHM 23	ECG RHYTHM 24	RESCUE METHOD USED	Airway provider 5 -point likert scale(comfortability level)
68	1130031	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
69	846160	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
70	1167868	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
71	1168918	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
72	1171068	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
73	1171945	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
74	1175068	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
75	1174575	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
76	1168169	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
77	1177046	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
78	1177636	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
79	1176164	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
80	1180888	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
81	1180422	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
82	1181397	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
83	1183046	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
84	1175742	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
85	1028275	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
86	1181402	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
87	1177603	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
88	1002352	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
89	1180428	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
90	1156148	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
91	1186168	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
92	1166778	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
93	1186448	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
94	1115367	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
95	691816	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
96	1184918	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
97	1194707	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
98	1182276	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
99	1194602	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
100	742376	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
101	1191705	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
102	1197232	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
103	1154941	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
104	1093459	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
105	1192931	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
106	1198166	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
107	438915	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
108	1043493	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
109	1163201	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
110	538485	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
111	587337	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
112	1205017	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
113	203214	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
114	1207548	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
115	1180675	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
116	1211089	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
117	1213442	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
118	1213827	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
119	1213392	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
120	1215814	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
121	1169485	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
122	1213870	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
123	1218932	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
124	1218983	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
125	1219150	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
126	1220663	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
127	1118908	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
128	697050	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
129	1208608	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE
130	1203430	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
131	1222681	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	COMFORTABLE
132	979831	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NO	VERY COMFORTABLE

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Date 05/1/22

The Principal,
DMC, Ludhiana.

Subject: **Approval of Plan of Thesis.**

This is to inform you that the Faculty of Medical Sciences in its meeting held on 29.10.2021 has approved the plan of thesis of **Neetu Saroye**, a student of your college for **MD Anaesthesiology** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis

A randomised study to assess efficacy of two bag mask ventilation techniques: two handed ce versus dominant hand ce - non-dominant hand te.

Supervisor
Dr. Anju Grewal
Prof.,
Dept. of Anaesthesiology,
DMCH, Ludhiana.

Co-Supervisor

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The student has to submit the four copies of thesis (along with PDF format) , to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She must directed to attach a photocopy of this letter with the forwarding letter while submitting thesis to the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic,(if any).

Dr. S P Singh MS(Oph)
Controller of Examinations

Note :

21. *If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.*
22. *The student may submit the thesis as per the schedule already conveyed i.e for May/June examination 30th Nov of the preceding the year of examination and for Nov/Dec examinations 31st May of the year of examination.*

A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE - NON-DOMINANT HAND TE

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED

IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF MEDICINE

In

ANAESTHESIOLOGY

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES

FARIDKOT

MARCH, 2021

DR. NEETU SAROYE

DEPARTMENT OF ANAESTHESIOLOGY
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ABSTRACT OF PLAN OF THESIS

Title	A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE - NON-DOMINANT HAND TE
For the degree of	M.D. Anaesthesiology
Name of the candidate	Dr. Neetu Saroye
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Institution	Dayanand Medical College and Hospital, Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: Airway providers are often faced with emergent scenarios to manage oxygenation with bag mask ventilation(BMV) in unconscious apnoeic patients. Double handed techniques of bag mask ventilation have been found to be more effective when employed by airway providers. We propose to comparatively evaluate the efficacy of airway providers to effectively ventilate using either the traditional two-handed CE technique or a two-handed hybrid technique combining use of dominant hand CE with Non dominant hand TE technique.

Aim of Study: To compare the 2 minute (24 breaths) mean exhaled tidal volume attained with both mask holding techniques by airway providers.

Materials & methods: A total of 132 patients will be randomised into 2 groups A and B. Patients in group A will undergo BMV with two-handed CE technique of mask ventilation for 2 minutes (24 breaths) by assigned airway provider, while patients in group B will undergo BMV with Dominant hand CE with Non dominant hand TE hybrid technique for 2 minutes (24 breaths) by the assigned airway provider.The data including exhaled tidal volume, SpO_2, $EtCO_2$ and comfortability scale will be recorded and statistically analysed.

Clinical significance: BMV is a critical life-saving skill hence airway providers need to be educated on techniques which are comfortable to learn and result in effective ventilation.

Keywords: Airway providers, Double-handed CE & TE Bag Mask ventilation techniques.

Neetu Saroye Gurpreeti Kaur Anjugrewal

(Signature) Candidate | (Signature) Co-supervisor | (Signature) Supervisor | (Signature) Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled **"A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE - NON-DOMINANT HAND TE"** exist in the Department of Anaesthesiology at Dayanand Medical College and Hospital, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis are genuine and is collected by the candidate herself under our supervision and guidance.

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APPROVAL PROFORMA
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BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

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4	DATE OF ADMISSION OF COURSE	30 June 2020
5	TITLE OF THE TOPIC	**A randomised study to assess efficacy of two Bag mask ventilation techniques :Two handed CE versus Dominant hand CE-Non-Dominant hand TE**

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Bag mask ventilation (BMV) is the core airway management skill for maintenance of oxygenation in unconscious apnoeic patients encountered in operating rooms, emergency department or during out of hospital emergencies.[1] Hence it is crucial for all airway providers to be proficient in the techniques of effective BMV.

Successful BMV requires adequate face mask seal, decreased airway resistance and optimal respiratory compliance.[1] The former two factors can be improvised by employing double handed BMV techniques. Traditionally CE technique of BMV is recommended by many health care agencies like the American Heart Association ,New England Journal of Medicine videos in Clinical Medicine etc.[2,3] This technique involves use of thumb and index finger to form the shape of "C" around the mask, with the other three fingers forming the letter "E" on the inferior portion of the mandible.[2-4] However it has been reported in a study that the upward force generated by the fifth finger at the angle of the jaw is insufficient to anteriorly advance the mandible for relieving upper airway obstruction.[4] An alternative mask seal technique called the Thenar Eminence (TE) technique involves downward pressure with thenar eminences while the four fingers of each hand pull the jaw upwards towards the mask.[4] This technique has been shown to enhance airway patency due to advancement of lower jaw by all four fingers with concomitant lack of compression on the sub-mandibular tissue.[4,5]

These two-handed techniques have been proposed to provide better seal with adequate airway patency thus generating greater tidal volumes.[5] However they require an additional provider or a mechanical ventilator to provide positive pressure breaths. Use of the mechanical ventilator which is now commonly incorporated in all anaesthesia workstations confers the advantage of providing an additional objective diagnostic information for assessing effectiveness of BMV techniques used. In addition pre-setting the peak airway

pressure to less than 15 cms of H_2O with use of pressure control ventilation has been reported to provide effective mask ventilation with minimal gastric insufflation.[1,6,7]

Studies have evaluated the two handed CE technique with two handed TE or the similarly modified VE technique in both patients and manikins with conflicting results.[4,5,8] In a mannequin based study Soleimanpour et al evaluated the quality of four different BVM ventilation techniques – E-C, Thenar Eminence (TE), TE (Dominant hand)-E-C (Non dominant hand), and TE (Non dominant hand)-E-C (Dominant hand) – among novice and experienced group of providers. They observed that the TE (non-dominant hand) - E-C (dominant hand) technique resulted in statistically significant effectiveness of BMV in terms of chest expansion than the other techniques among novice providers, whereas the experienced group could perform all these four techniques with equal proficiency.[9] Gerstein NS et al also reported superiority of two handed TE over CE technique in their study evaluating efficacy of BMV in novice providers between the traditional E-C clamp or TE technique.[4]

On the other hand Althunayyan et al in a randomized crossover study reported superiority of two handed CE over VE technique in terms of number of effective breaths and comfortability despite comparably similar median exhaled tidal volumes. However the study was conducted on a simulation model with respiratory therapists who are usually well versed with the techniques of BMV.[8]

In real life clinical scenarios wherein prolonged BMV is needed, provider comfort is also a concern. Perhaps combining the familiar traditional CE technique with TE technique might result in higher degree of effectiveness of BMV. In view of the conflicting literature evidence we propose to comparatively evaluate the efficacy of two handed BMV techniques, the traditional CE versus the hybrid technique of dominant hand CE with non-dominant TE, when performed by airway providers in human subjects who do not have predictors of difficult BMV.

6.2 REVIEW OF LITERATURE

Bag mask ventilation (BMV) is one of the basic skills of airway management. Although BMV seems easy but it can be a great challenge especially when needed for extended time period by providers of variable experience.[9] Mask ventilation is required by all patients undergoing general anaesthesia after the patient becomes apnoeic. Failure to achieve effective mask ventilation may be rescued by successful intubation, but in majority of the cases difficult intubation often coexists with difficult mask ventilation.[10] This may predispose to hypoxia and if uncorrected may lead to hypoxic brain damage or death.[11]

Reported epidemiological data suggest that difficult BMV occurs in 1.4% of patients undergoing general anaesthesia and in 4-11% of patients presenting to emergency settings.[12,13] Difficult BMV results due to inadequate mask seal, increased airway resistance and decreased lung or chest wall compliance.[1] There is discriminate flow of gas to lower resistance path, thus an inadequate seal at mask – patient interface will provide low resistance escape of positive pressure breaths.[1] Langeron et al in 2000 identified various factors that can cause difficulty in BMV, which include age >55 years, BMI>26 kg/m^2, beard, edentulous patient and history of snoring.[14]

Keeping in mind the difficulties in BMV, various optimization measures have been described in literature. The problem of inadequate mask seal can be overcome by using small appropriate fitting mask to reduce dead space and eye compression. Also the top of the mask should be placed slightly inferior to bridge of nose to avoid leak into the eyes.[1] Taxak et al in 2008 stated that using a rolled up gauge that covers the vestibule of the oral cavity in a packed way can improve BMV in edentulous patients.[15] Placing the inferior part of mask inside the lower lip at alveolar ridge has also been proposed to improve mask seal in edentulous patients.[16]

A report by American society of Anaesthesia task force on management of the difficult airway in 2003, stated that problems in

BMV can occur due to issues like insufficient coverage of mask on face, air leak and high resistance to air stream.[17] Many of these issues could be resolved by adapting to two-hand techniques of BMV.

Aaron et al in 2009 conducted a prospective randomized cross over study in adult obese patients with BMI >30kg/m^2 comparing one-handed EC clamp technique with two-handed jaw thrust technique. In one handed technique, jaw thrust was performed by placing operator thumbs on oropharyngeal airway and then simultaneously pulling the mandible forward with index finger and second finger of both hands. An appropriate sized mask was then placed over bridge of nose and mouth followed by chin lift and head tilt. In two- handed technique, the face mask was first placed over the bridge of nose and mouth then held in place by performing jaw thrust maneuver with the index finger of each hand and maintaining mask contact with patients face using both thumbs. Each technique was performed for 5 consecutive breaths and resulting tidal volumes were recorded. The primary outcome of the study was total minute ventilation in litres per minute and the exhaled tidal volume. They observed that inadequate or dead space ventilation occurred more frequently during one handed technique as compared to two handed technique.[6]

BMV is a critical airway skill that is required both in emergency and nonemergency conditions by health care providers with limited airway experience as well. The traditional EC technique has been compared with other BMV techniques so as to elucidate an optimized BMV technique for use in novice airway providers.

Gerstein et al in 2012 conducted a randomized crossover comparison study on 60 novice clinicians (medics and paramedics) who had no or limited experience of airway management .Subjects were assigned to perform 2 two-handed mask grip techniques :TE (in which downward pressure is applied with the thenar eminence while the 4 fingers of each hand pull the jaw upwards towards the mask) or EC clamp technique (in which thumb and the index finger form a C around the neck of the mask and other 3 fingers form E on the inferior portion of

the mandible). The subjects performed each technique on the same patient undergoing general anaesthesia in crossover manner for 1 minute (12 breaths). The primary outcome was mean expired tidal volume compared between both groups and secondary outcome was mean peak inspiratory pressure (PIP). TE grip resulted in greater expired tidal volume (379 ml vs 269 ml). Using EC grip first resulted in an average tidal volume improvement of 200 ml after crossover to the TE grip. There was no significant difference in PIP using the two grips. The results of the study however cannot be applied in emergency situations and there may be substantial difference depending on hand size .In addition as the study was done for 2 minutes hence it is difficult to comment as to how each grip will perform over a longer period of time.[4]

Goneppanaver Umesh et al in 2013 conducted a prospective randomized and crossover study on manikin wherein they compared EO technique to EC technique which was performed by a total of 100 experienced and novice volunteers. The EO technique involved encircling the neck of the mask with web between the thumb and the index finger while the other digits performed the chin lift. The 2 independent observers recorded the chest expansion as 1(nil), 2 (minimal), 3(moderate) and 4(good).The chest expansion was considered ideal if both observers gave 4 scores, average if both or any one of the observer gave 3 and poor if observer gave 1 or 2. They concluded that with conventional EC clamp the chest expansion was ideal, average and poor in 31, 18 and 1 instances respectively among the experienced and 17, 22 and 11 respectively with novice volunteers. With EO technique the chest expansion was ideal, average and poor in 38, 9 and 3 instances with experienced and 32, 14 and 4 respectively in novices. In cross over analysis for experienced providers, the both techniques had similar chest expansion on maximal occasions but in case of novices, EO technique was better than EC technique.The limitation of the study is that it is manikin based study. Secondly other important parameters such as tidal volume and peak airway pressure were not evaluated.[18]

The superiority of two handed technique has also been described in study by David Otten et al in 2014. They conducted a prospective crossover study on 52 subjects (physicians, residents, medical students who have diversity of experience) in which they performed 1-handed, 2-handed (in which thumb and index finger forms a C around the mask apex and remaining fingers lifts the jaw) and modified 2 –handed (in which third finger is shifted down to angle of jaw to pull upwards and uses thenar eminence and thumb to apply downwards force on mask) BMV technique on standardized ventilation model. Subjects performed each technique for 5 minutes. The primary outcome of the study was expired tidal volume measured by specialized inline monitor. They concluded that 1 handed technique resulted in lower median expired tidal volume than 2 –handed technique, but there was no difference between the tidal volume generated by both 2 handed techniques. The limitation of the study was that it was not done on patients, hence the patient factors affecting BMV were not studied. Difference in sex hand width, strength and experience may have influenced the results.[19]

Maryam Soleimanpour et al in 2016 compared the efficacy of the four techniques (EC, Thenar eminence, Thenar eminence (dominant hand)-EC (non-dominant hand) and Thenar eminence (non dominant hand)-EC (dominant hand) of mask ventilation in the two groups of experienced and novice staff on manikins. They recruited 120 volunteers and divided them into 2 groups of 60 experienced and 60 novices. Every participant in each group performed 4 BMV techniques under the guidance of an experienced assessor. The quality of manikin chest expansion was recorded using four scale scoring system .In this scoring system score 1 indicated no appreciable chest expansion ,score 2- minimal chest expansion ,score 3-moderate chest expansion, score 4-good chest expansion. Ventilation efficacy was considered as ideal, average and weak if the achieved scores were(4-4),(3-3 or 3-4 or 4-3) and (1 or 2 at any of the attempts) respectively. They concluded that novice group performed Thenar –eminence (nondominant hand)–EC(dominant hand) technique better than the other techniques. But in

experienced group there was no significant difference between all techniques.[9]

Fei et al in 2017 compared the effectiveness of two handed CE technique and VE clamp technique of mask ventilation on 81 unconscious obese (BMI>30kg m^2) adults undergoing general anaesthesia in a randomized crossover study. Patients were kept on mechanical ventilation using pressure control mode. The ventilation was started with either CE technique followed by VE technique (group A) or with the reverse sequence (group B).The primary outcome studied was expired tidal volume .The investigators concluded that the exhaled tidal volume was significantly lower for CE technique than the VE technique (371(SD 345) vs 720(244) ml, P<0.001) and observed that the subjects who failed ventilation with CE technique could be ventilated effectively with VE technique.[5]

Soleimanpour M et al conducted a manikin based study in 2018, in which they compared 3 techniques of mask ventilation :Thenar eminence, EO and EC technique among undergraduate students and senior group .Each participants performed six ventilations with bag and mask (each technique 2 times). The ventilation quality by bag and mask in two groups was recorded based on rise of lungs and opinion of reviewer who gave a score from 1 as weak to 4 as excellent using three techniques. They concluded that undergraduate group performed EO technique appropriately and better than other 2 techniques.[20]

Goneppanavar Umesh et al in 2018 conducted a double blinded prospective crossover study on 60 patients who were randomly allocated to EO and EC group. After adequate anaesthesia and neuromuscular blockade, a novice (experience of less than 5 attempts of BMV) held the mask with preferred hand using the allocated technique, while the ventilator provided 5 breaths at set pressure control of 15 cm H_2O with one second each for inspiration and expiration. The primary outcome was exhaled tidal volume for each breath for 5 consecutive breaths. The secondary outcomes were minute ventilation, audible mask leak and epigastric leak. They concluded that the average tidal volume difference between the groups

was about 46.5±106.6 ml over five breaths with EO technique providing superior values as compared to EC technique(286.2±107.41 vs 239.56±103.95 ml).The minute ventilation was also higher with the EO technique (2.86±1.05 L/min) as compared to EC technique (2.35±1.12 L/min).This study demonstrated that EO technique provides better mask seal in hands of novices as reflected by better tidal volumes and minute ventilation by this technique.[21]

Althunayyan et al in 2020 conducted a randomised crossover study and compared the two-handed CE and two-handed VE techniques performed by a total 74 respiratory therapists on a simulation model .Each participant performed 2-minute ventilation session (24 breaths) for each technique. For each technique mean tidal volume and the successful breaths (≥300 ml) was recorded. The comfortability was assessed through a 4-item likert scale questionnaire that consisted of 5 points for each question assessing the level of agreement on each question where 1 indicated very easy to control the mask during ventilation and 5 indicated that it was too difficult. They concluded that there was no statistically significant difference in the mean tidal volume between the both techniques. The CE technique resulted in more percentage of effective breaths as compared to VE technique and most of the participants reported two-handed CE technique to be more comfortable.[8]

Taken together, these studies suggest that both two-handed EC technique and TE technique are effective techniques for BMV when used by providers with limited airway management experience. We hypothesized that perhaps use of a BMV technique which combines the EC and TE grip might prove superior to use of any one technique solely. Therefore we propose to comparatively evaluate the efficacy of traditional two-handed CE technique with a hybrid BMV technique of Dominant hand CE –Non-dominant hand TE in subjects who do not have predictors of difficult mask ventilation (DMV).

6.3 AIMS AND OBJECTIVES OF THE STUDY

PRIMARY OBJECTIVE:

To compare 2 minutes (24 breaths) mean exhaled tidal volume between the both mask holding techniques by airway providers

SECONDARY OBJECTIVES:

- To compare the number of failed breaths as reflected by no exhaled tidal volume among both techniques
- To compare the comfortability score with the use of both techniques using 5 point Likert scale

7. MATERIALS AND METHODS

7.1 SOURCE OF DATA

A randomised prospective study will be conducted in the department of Anaesthesiology, Dayanand Medical College and Hospital, Ludhiana after approval by Institutional Ethics Committee on 132 ASA I & II adult patients (18-55 years of age) scheduled to undergo General Anaesthesia (GA) for elective surgical procedures. Bag mask ventilation (BMV) in these recruited patients will be performed by an airway provider with less than 3 years of experience in airway management procedure .A written informed consent will be obtained from each patient and airway provider both for participation in the study.

7.2 METHOD OF COLLECTION OF DATA

7.3 INCLUSION CRITERIA

- **Patients**: All adults (18-55 years of age), ASA grade I & II, having a Modified Mallampatti Score (MPS) I & II, with absence of any of the predictors of difficult mask ventilation (DMV) presenting for elective surgeries under general anaesthesia.

  Airway provider: Airway providers with less than 3 years of experience in airway management procedures**.**

EXCLUSION CRITERIA:

- Full stomach patients requiring rapid sequence intubation.
- Predicted difficult airway including DMV [Table 1]
- Pregnant patients
- Haemodynamically unstable patient belonging to ASA 3 and 4
- An airway provider with $\geq$ 3 years of experience in airway management procedures.

TABLE 1
PREDICTORS FOR DIFFICULT BMV[22]
1.Age>55 Years
2.BMI>30 Kg /m^2
3.H/O snoring
4. H/O Neck radiation

5.H/O ankylosing spondylitis
6.Facial asymmetry
7.Beard
8.Bilateral blocked nostrils
9.Edentulous
10.MMP (Modified mallampatti class) >2
11.Upper lip bite test II and III
12.Thyromental distance <6cm
13.Neck circumference >40/42cm (F/M)
14.Decreased neck range of motion
15.Poor lung/chest compliance

3. GROUP ALLOCATION

A total of 132 patients will be recruited after accounting for 10% of dropouts .They shall be randomly assigned equally into either of the 2 groups A and B by computer generated randomized codes contained in sealed, sequentially numbered envelopes, which shall be opened by an anaesthesiologist not involved in the study.

GROUP A: Patients will undergo BMV with two-handed CE technique of mask ventilation for 2 minutes (24 breaths) by the assigned airway provider.

GROUP B: Patients will undergo BMV with the two –handed Dominant hand (CE) and Non-dominant hand (TE) technique of mask ventilation for 2 minutes (24 breaths) by the assigned airway provider.

4. STUDY METHODOLOGY

Pre-Procedural Training of Airway providers : After obtaining written consent from participating airway providers, a brief training session comprising of video-demonstration and hands–on skill performance on manikins (Airway management trainer, Laerdal Co. Ltd]) for a period of 30 minutes will be conducted by the thesis supervisor prior to inclusion in the study.

Pre-Anaesthesia Check-up of the Patient:

All patients will undergo routine thorough pre-anaesthesia check-up comprising of a detailed history including a focused airway history, general physical examination, and focused airway examination to rule out presence of any predictors of DMV. Patients will be explained about the study being conducted and written informed consent will be taken. Relevant investigations will be sent and reviewed. Demographic information and preoperative variables including, age, gender, height, weight, Body mass Index, ASA status will be recorded.

Anaesthesia Technique and Study Protocol:

Before starting the study in the operation room (OR), the airway providers will be shown a 2-minute video of the technique and will also be shown pictures demonstrating the techniques [Figure 1 A & B].

Figure 1 A: Two handed CE technique of BMV: In this the thumb and the index finger of both hands forms shape of letter C around the mask attempting to secure mask tightly around patient`s mouth and nose and the other three fingers forms the letter E on the inferior portion of mandible where the little finger provides jaw thrust and middle and ring finger rest on the rim of mandible.[4,21]

Figure 1 B: Two handed Dominant hand CE with Non- dominant hand TE technique: In this technique the dominant hand is used to perform CE technique and non-dominant hand is used to perform TE technique (in which downward pressure on mask is applied with the thenar eminence while the 4 fingers of each hand pull jaw upwards towards the mask.[4]

In the operating room, monitors in the form of pulse oximeter, non-invasive blood pressure (NIBP), 5-lead electrocardiography (ECG), will be attached and continuous monitoring of heart rate, ECG rhythm, SpO2 will be done. NIBP will be recorded at every 1-minute interval. An experienced consultant anaesthesiologist not participating in the study will be assigned to manage the anaesthesia for the case. A wide bore IV cannula will be secured and intravenous injection of midazolam 0.05mg/Kg will be given as premedication. An appropriately sized well-fitting transparent mask will be used for each patient. Adequate pre-oxygenation with 100% oxygen at flow rate of 10L/min will be done for 3 minutes. General anaesthesia will be induced with 2-3 mg /kg of propofol, 1.5mg/kg of lidocaine and 1-2 mcg of fentanyl intravenously (IV). Neuromuscular blockade (NM-blockade) will be established with inj. atracurium 0.5mg /kg IV. The anaesthesia machine will be preset in pressure control mode to deliver 12 breaths /min, peak inspiratory

pressure (PIP) of 15 cms of H2O, an I:E ratio of 1:2, with no positive end expiratory pressure. The consultant anaesthesiologist assigned to the case will perform BMV to confirm adequate BMV for an initial 1-minute period, before handing over the mask to the designated airway provider to ensure the safety of the patient. If this experienced consultant anaesthesiologist encounters inadequate BMV, the patient will not be included in the study. Inadequate BMV will be defined as exhaled tidal volume (VTe) < 4ml/Kg of predicted body weight or less than 150ml per breath with clinical signs like inadequate chest rise, no fogging in the mask, no positive tracing of $EtCO_2$, and/or lack of measurable VTe on anaesthesia ventilator display.[6,21]

After adequate BMV by experienced anaesthesia consultant, the airway provider will start with the assigned technique as per random allocation of the patient. Each airway provider will perform the assigned technique for 2 minutes (24 breaths) as described in Figure 1 A/B. The investigator (i.e., the thesis student) will record all data manually from the anaesthesia machine ventilator display. The protocol will be aborted in case of any observed decrease in SpO2 to <94% or in the event of any haemodynamic instability. In that case the consultant anaesthesiologist will intervene and take over the patient management. The data of zero will be entered for the remaining breaths of such patient.

After the completion of study, the consultant anaesthesiologist assigned for the case, will continue with further anaesthesia induction and management of the patient as per standard protocol.

5. OBSERVATIONS:

Exhaled tidal volume (VTe), SpO_2, $EtCO_2$ for each breath will be recorded. In addition vital parameters like HR, NIBP, ECG rhythm will also be recorded during the period of study.

6. Outcomes:

PRIMARY OUTCOME

Primary outcome will be the 2 minute (24 breaths) mean exhaled tidal volume between the both mask holding techniques .

SECONDARY OUTCOMES

1. **Failed Breaths:** The number of failed breaths as reflected by no exhaled tidal volume recorded by anaesthesia machine display
2. **Comfortability of both techniques to airway providers:** Comfortability level of the airway provider with the use of assigned technique using 5-point Likert scale.

5 –POINT LIKERT SCALE

1. Very comfortable **2**. Comfortable **3**. Neutral **4**. Uncomfortable **5**. Very uncomfortable

STATISTICAL ANALYSIS

Data will be described in terms of range, mean standard deviation (SD), median, frequencies (number of cases) and relative frequencies (number of cases) and relative frequencies (percentages) as appropriate. Comparison of quantitative variable between the study groups will be done using student t-test and Mann-Whitney test. A probability value (p value) less than 0.05 will be considered statistically significant. All statistical calculations will be done using (statistical package for the social science) SPSS 21 version (SPSS inc, Chicago IL USA) statistical program for Microsoft windows.

SAMPLE SIZE CALCULATIONS

The objective of the study is to compare the 2 minute (24 breaths) mean exhaled VTe between both the two mask holding techniques by airway providers.

The formula used is as under:

$n = (\sigma 12 + \sigma 22)\ (Z\alpha + Z\beta)2/(\ m1 - m2)2$

Where,

$Z\alpha$ = Value of standard normal variate corresponding to α level of significance (1.96)

$Z\beta$ = The standard normal deviate for desired power(0.8416) m = Average

σ = Standard deviation

Assumptions:

From the study conducted by …… Gerstein NS, Carey MC, Braude DA, Tawil I, Peterson TR, Deriy L,et.al .Efficacy of face mask

ventilation techniques in novice providers. J Clin Anaesth 2013;25:193-7

Mean Group (m1) = 379ml

Mean Group (m2) = 269ml

Coefficient of variation = 150%

Standard deviation Group (σ1) = 172

Standard deviation (σ2) = 197

Change in the parameters (m1– m2) = 110ml

With the above assumptions the sample size for 95% confidence level & 90% power works out 60 in each group. Hence accounting for 10% dropouts, a sample size of 60 patients in each group will be recruited.

7.4 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

No

7.5 HAS ETHICAL CLEARENCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Attached along with.

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DEPARTMENT OF ANAESTHESIOLOGY

DAYANAND MEDICAL COLLEGE AND HOSPITAL, LUDHIANA

PROFORMA

Serial Number: Group: MRD No. Date of surgery:
Name of Surgery planned:

DEMOGRAPHIC DATA:

Age (Years): Gender Height (cm): Weight (kg):
BMI (kg/m²): ASA grade: I II III IV V E

COMORBIDITIES: Diabetes Mellitus ( ) Hypertension ( ) Any other:

FOCUSED AIRWAY HISTORY & EXAMINATION

Previous History if any of Difficult BMV in past	Yes/ No
Snoring	Yes / No
History of neck radiation	Yes / No
History of Ankylosing Spondylitis	Yes / No
Dentition	Partial / Full / Edentulous
Bearded	Yes / No
Bilateral blocked nostrils (Nasal patency test)	Blocked/Patent
Mouth opening (cm)	
Thyromental distance (cm)	<6.0 cms – Yes/ No
Neck movement {decreased range of motion}	80-90 deg/<80 deg
Neck circumference (cm)	> 40/42 (F/M) – Yes / No
Temporomandibular joint mobility	Adequate/restricted
Upper lip bite test	Class I / II / III
Modified Mallampati grade	I II III IV
Abnormal head, neck or airway anatomy, Facial asymmetry	Yes / No (Specify)

Patient's Baseline Vital parameters: HR/min NIBP mmHg SpO_2 (%) RR/min

Characteristics of airway providers: Age (years) Gender: Male / Female
Speciality : Level of experience in bag mask ventilation(months):

SIGNATURE OF CANDIDATE **SIGNATURE OF SUPERVISOR**

VENTILATORY PARAMETERS: PRESSURE CONTROL MODE OF VENTILATION WITH PIP =15 cms of H_2O; RR -12/min; PEEP=0; I:E=1:2

OBSERVED VENTILATORY PARAMETERS:

BREATHS	Exhaled TV in assigned Group	$EtCO_2$	SpO_2	FAILED BREATH	HR /min	NIBP mmHg	ECG RHYTHM
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

SIGNATURE OF CANDIDATE **SIGNATURE OF SUPERVISOR**

$ETCO_2$=End tidal carbon-dioxide SPO_2 =Oxygen saturation NIBP=Non invasive blood pressure HR= Heart rate

Rescue Methods for BMV if needed:

Use of adjuncts [ ]; Experienced operator [ ]; Use of LMA [ ]; Any other method used [ ]

Airway Provider Comfort Scale (5 point Likert Scale)

1. Very comfortable [ ]
2. Comfortable [ ]
3. Neutral [ ]
4. Uncomfortable [ ]
5. Very uncomfortable[ ]

SIGNATURE OF CANDIDATE

SIGNATURE OF SUPERVISOR

INFORMED PATIENT CONSENT

Date: _____

I.....D/o, W/o, S/o..... .....am willing to participate in the study **"A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE - NON-DOMINANT HAND TE"** The procedure with its complications has been explained to me in local vernacular language. I have fully understood that no special tests and extra expenditure in any form, merely for the purpose of thesis is being carried out. I am free to opt out the study any time without assigning any reason.

....

Signature of the Witness Signature of the patient

Name:

Signature of Supervisor **Signature of Candidate**

मरीज अनुमति फार्म

तिथि _____

मैं _____पत्नी/पुत्र/पुत्री _____ निवासी _____ इस शोधकार्य **"A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE - NON-DOMINANT HAND TE"** में भाग लेने के लिए सहमत हूँ। मैं इस शोधकार्य में भाग लेने के लिए अपनी स्वेच्छा से तैयार हूँ। मैं पुष्टि करता/करती हूँ की यह स्वीकृति देने के लिए मुझे कोई आर्थिक प्रलोभन नहीं दिया गया और न ही दबाव डाला गया है। मुझे इस शोधकार्य का उद्देश्य स्पष्ट कर दिया गया है और मुझे यह विश्वास है की यह विज्ञान और मानवता के लाभ के लिए है। मुझे इस शोधकार्य में होने वाले जोखिम के बारे में समझा दिया गया है और मेरी समझ में यह जोखिम बहुत मामुली है।

मैं इस शोधकार्य में भाग लेने के सम्बन्ध में किसी भी समय अपनी अस्वीकृति व्यक्त कर सकता/सकती हूँ और मेरे अस्वीकृति व्यक्त करने का मेरे इलाज पर कोई प्रभाव नहीं पड़ेगा।

_____	_____
गवाह के हस्ताक्षर	रोगी के हस्ताक्षर/अंगूठे का निशान
नाम:	नाम:

_____

अन्वेषक के हस्ताक्षर

_____

विद्यार्थी के हस्ताक्षर

ਮਰੀਜ਼ ਰਜ਼ਾਮੰਦੀ ਫਾਰਮ

ਮਿਤੀ_____

ਮੈ_____ਪਤਨੀ/ਪੁੱਤਰ/ਪੁੱਤਰੀ_____ਵਾਸੀ

_____

"A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE - NON-DOMINANT HAND TE" ਤੇ ਚਲ ਰਹੀ ਖੋਜ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਰਜ਼ਾਮੰਦ ਹਾਂ। ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਲਈ ਮੈ ਆਪਣੀ ਮਰਜ਼ੀ ਨਾਲ ਤਿਆਰ ਹਾਂ। ਮੈ ਇਹ ਦਸਣਾ ਚਾਹੁੰਦਾ ਹਾਂ/ ਚਾਹੁੰਦੀ ਹਾਂ ਕੇ ਇਹ ਰਜ਼ਾਮੰਦੀ ਦੇਣ ਵਾਸਤੇ ਮੈਨੂ ਕਿਸੇ ਵੀ ਤਰਾਂ ਦਾ ਲੋਭ-ਲਾਲਚ ਨਹੀ ਦਿੱਤਾ ਗਿਆ ਅਤੇ ਨਾ ਹੀ ਕੋਈ ਦਬਾ ਪਾਇਆ ਗਿਆ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਦਾ ਮਨੋਰਥ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਭਰੋਸਾ ਦਵਾਇਆ ਗਿਆ ਹੈ ਕੇ ਇਹ ਖੋਜ ਵਿਗਿਆਨ ਅਤੇ ਮਾਨਵਤਾ ਦੀ ਭਲਾਈ ਲਈ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਵਿਚ ਹੋਣ ਵਾਲੇ ਖਤਰੇ ਬਾਰੇ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ ਅਤੇ ਮੈਨੂ ਇਹ ਯਕੀਨ ਹੈ ਕੇ ਇਹ ਖਤਰਾ ਬਹੁਤ ਮਾਮੂਲੀ ਹੈ। ਮੈਨੂ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਦਾ ਢੰਗ – ਤਰੀਕਾ ਸਮਝਾ ਦਿੱਤਾ ਗਿਆ ਹੈ।

ਮੈ ਇਸ ਖੋਜ ਕੰਮ ਵਿਚ ਹਿੱਸਾ ਲੈਣ ਬਾਰੇ ਆਪਣੀ ਰਜ਼ਾਮੰਦੀ ਕਿਸੇ ਵੀ ਸਮੇ ਵਾਪਸ ਲੈ ਸਕਦਾ ਹਾਂ/ ਸਕਦੀ ਹਾਂ ਅਤੇ ਮੇਰੀ ਰਜ਼ਾਮੰਦੀ ਵਾਪਸ ਲੈਣ ਦਾ ਮੇਰੇ ਇਲਾਜ ਤੇ ਕੋਈ ਅਸਰ ਨਹੀ ਹੋਵੇਗਾ।

_____ _____

ਗਵਾਹ ਦੇ ਹਸਤਾਖਰ ਮਰੀਜ਼ ਦੇ ਹਸਤਾਖਰ

ਮਿਤੀ_____ ਮਿਤੀ_____

ਪਤਾ _____ ਪਤਾ _____

_____

ਨਿਰੀਖਕ ਦੇ ਹਸਤਾਖਰ

_____

ਸਿਖਿਆਰਥੀ ਦੇ ਹਸਤਾਖਰ

AIRWAY PROVIDER CONSENT FORM

DATE:

I Dr.....D/O, W/O, S/O .....
..... am willing to participate in the study "**A RANDOMISED STUDY TO ASSESS EFFICACY OF TWO BAG MASK VENTILATION TECHNIQUES: TWO HANDED CE VERSUS DOMINANT HAND CE - NON-DOMINANT HAND TE ".** I have fully understood the purpose of the study and I am willing to undergo the training process required for the study. I am free to opt out the study anytime without assigning any reason

.....
Signature of the witness
Name:

.....
Signature of Airway provider
Name:

Signature of the Supervisor

Signature of the candidate